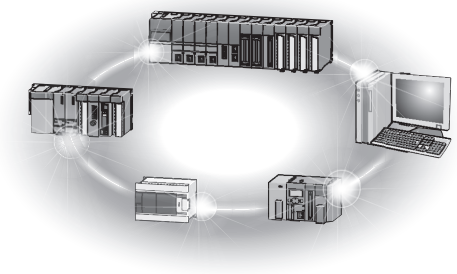
MITSUBISHI ELECTRIC

Mitsubishi Programmable Controller

Analog-Digital Converter Module Type AJ65VBTCU-68ADVN/ADIN User's Manual



• SAFETY PRECAUTIONS •

(Read these precautions before using this product.)

Before using this product, please read this manual and the relevant manuals introduced in this manual carefully and pay full attention to safety to handle the product correctly.
The precautions given in this manual are concerned with this product. Refer to the user's manual of the CPU module to use for a description of the programmable controller system safety precautions.
In this manual, the safety precautions are classified into two levels: "⚠WARNING" and "⚠CAUTION".

⚠WARNING	Indicates that incorrect handling may cause hazardous conditions, resulting in death or severe injury.
⚠CAUTION	Indicates that incorrect handling may cause hazardous conditions, resulting in minor or moderate injury or property damage.

Under some circumstances, failure to observe the precautions given under "⚠CAUTION" may lead to serious consequences.
Observe the precautions of both levels because they are important for personal and system safety.
Make sure that the end users read this manual and then keep the manual in a safe place for future reference.

[Design Precautions]

⚠ WARNING

- In the case of a communication failure in the network, data in the master module are held.
  Check the communication status information (SB, SW) and configure an interlock circuit in the sequence program to ensure that the entire system will operate safely.

⚠ CAUTION

- Do not install the control lines or communication cables together with the main circuit lines or power cables.
  Keep a distance of 100mm (3.94 inches) or more between them.
  Failure to do so may result in malfunction due to noise.

[Installation Precautions]

⚠ CAUTION
• Use the programmable controller in an environment that meets the general specifications in the detailed manual. Failure to do so may result in electric shock, fire, malfunction, or damage to or deterioration of the product. • Securely fix the module with a DIN rail or CC-Link connector type metal installation fitting. Not doing so can cause a drop or malfunction. • Do not directly touch any conductive part of the module. Doing so can cause malfunction or failure of the module.

[Wiring Precautions]

⚠ CAUTION
• Shut off the external power supply for the system in all phases before wiring. • Individually ground the FG terminal of the programmable controller with a ground resistance of 100Ω or less. Failure to do so may result in malfunction. • Check the rated voltage and pin layout before wiring to the module, and connect the cables correctly. Connecting a power supply with a different voltage rating or incorrect wiring may cause a fire or failure. • Prevent foreign matter such as dust or wire chips from entering the module. Such foreign matter can cause a fire, failure, or malfunction. • Do not insert the one-touch connector plug for I/O of the one-touch connector type/connector type compact remote I/O unit into the one-touch connector for analog I/O accidentally. Doing so can cause the module to be damaged. • Attach an unwired connector plug to an unused one-touch connector for power supply and FG. Not doing so can cause a failure or malfunction. • Place the cables in a duct or clamp them. If not, dangling cable may swing or inadvertently be pulled, resulting in damage to the module or cables or malfunction due to poor contact. • Do not install the control lines or communication cables together with the main circuit lines or power cables. Failure to do so may result in malfunction due to noise. • When disconnecting the cable from the module, do not pull the cable by the cable part. Loosen the screws of connector before disconnecting the cable. Failure to do so may result in damage to the module or cable or malfunction due to poor contact. • Smoke and fire may occur when an overcurrent flows intermittently for a long period of time. To avoid this, configure a safety circuit, such as an external fuse, to protect the product.

[Starting and Maintenance Precautions]

⚠ CAUTION
• Do not touch any pin while power is on. Doing so will cause malfunction. • Shut off the external power supply for the system in all phases before cleaning the module. Failure to do so may cause the module to fail or malfunction. • Do not disassemble or modify the modules. Doing so may cause failure, malfunction, injury, or a fire. • Do not drop or apply strong shock to the module. Doing so may damage the module. • Shut off the external power supply for the system in all phases before mounting or removing the module to or from the panel. Failure to do so may cause the module to fail or malfunction. • Before handling the module, touch a grounded metal object to discharge the static electricity from the human body. Failure to do so may cause the module to fail or malfunction.

[Disposal Precautions]

⚠ CAUTION
• When disposing of this product, treat it as industrial waste.

• CONDITIONS OF USE FOR THE PRODUCT •

(1) Mitsubishi programmable controller ("the PRODUCT") shall be used in conditions;
i) where any problem, fault or failure occurring in the PRODUCT, if any, shall not lead to any major or serious accident; and
ii) where the backup and fail-safe function are systematically or automatically provided outside of the PRODUCT for the case of any problem, fault or failure occurring in the PRODUCT.

(2) The PRODUCT has been designed and manufactured for the purpose of being used in general industries.
MITSUBISHI SHALL HAVE NO RESPONSIBILITY OR LIABILITY (INCLUDING, BUT NOT LIMITED TO ANY AND ALL RESPONSIBILITY OR LIABILITY BASED ON CONTRACT, WARRANTY, TORT, PRODUCT LIABILITY) FOR ANY INJURY OR DEATH TO PERSONS OR LOSS OR DAMAGE TO PROPERTY CAUSED BY the PRODUCT THAT ARE OPERATED OR USED IN APPLICATION NOT INTENDED OR EXCLUDED BY INSTRUCTIONS, PRECAUTIONS, OR WARNING CONTAINED IN MITSUBISHI'S USER, INSTRUCTION AND/OR SAFETY MANUALS, TECHNICAL BULLETINS AND GUIDELINES FOR the PRODUCT.
("Prohibited Application")
Prohibited Applications include, but not limited to, the use of the PRODUCT in;
- Nuclear Power Plants and any other power plants operated by Power companies, and/or any other cases in which the public could be affected if any problem or fault occurs in the PRODUCT.
- Railway companies or Public service purposes, and/or any other cases in which establishment of a special quality assurance system is required by the Purchaser or End User.
- Aircraft or Aerospace, Medical applications, Train equipment, transport equipment such as Elevator and Escalator, Incineration and Fuel devices, Vehicles, Manned transportation, Equipment for Recreation and Amusement, and Safety devices, handling of Nuclear or Hazardous Materials or Chemicals, Mining and Drilling, and/or other applications where there is a significant risk of injury to the public or property.

Notwithstanding the above, restrictions Mitsubishi may in its sole discretion, authorize use of the PRODUCT in one or more of the Prohibited Applications, provided that the usage of the PRODUCT is limited only for the specific applications agreed to by Mitsubishi and provided further that no special quality assurance or fail-safe, redundant or other safety features which exceed the general specifications of the PRODUCTs are required. For details, please contact the Mitsubishi representative in your region.

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REVISIONS

* The manual number is given on the bottom left of the back cover.

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Japanese Manual Version SH-080396-F

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INTRODUCTION

Thank you for purchasing the MELSEC-A series programmable controllers.
Before using this product, please read this manual carefully and develop familiarity with the functions and performance of the MELSEC-A series programmable controller to handle the product correctly.
Make sure that the end users read this manual.

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ABOUT MANUALS

The following manuals are also related to this product.

Order each manual as needed, referring to the following list.

Relevant manuals

Manual name	Manual number (model code)
CC-Link System Master/Local Module Type AJ61BT11/A1SJ61BT11 User's Manual System configuration, performance specifications, functions, handling, wiring, and troubleshooting of the AJ61BT11 and A1SJ61BT11 (Sold separately)	IB-66721 (13J872)
CC-Link System Master/Local Module Type AJ61QBT11/A1SJ61QBT11 User's Manual System configuration, performance specifications, functions, handling, wiring, and troubleshooting of the AJ61QBT11 and A1SJ61QBT11 (Sold separately)	IB-66722 (13J873)
MELSEC-Q CC-Link System Master/Local Module User's Manual System configuration, performance specifications, functions, handling, wiring, and troubleshooting of the QJ61BT11N (Sold separately)	SH-080394E (13JR64)
Type AnSHCPU/AnACPU/AnUCPU/QCPU-A (A Mode) Programming Manual (Dedicated Instructions) Instructions extended for the AnSHCPU/AnACPU/AnUCPU (Sold separately)	IB-66251 (13J742)
MELSEC-L CC-Link System Master/Local Module User's Manual Settings, specifications, handling, data communication methods, and troubleshooting of the built-in CC-Link function of the CPU module or the CC-Link system master/local module (Sold separately)	SH-080895ENG (13JZ41)

COMPLIANCE WITH EMC AND LOW VOLTAGE DIRECTIVES

(1) Method of ensuring compliance

To ensure that Mitsubishi programmable controllers maintain EMC and Low Voltage Directives when incorporated into other machinery or equipment, certain measures may be necessary. Please refer to one of the following manuals.

- User's manual for the CPU module or head module used
- Safety Guidelines
  (This manual is included with the CPU module, base unit, or head module.)

The CE mark on the side of the programmable controller indicates compliance with EMC and Low Voltage Directives.

(2) Additional measures

To ensure that this product maintains EMC and Low Voltage Directives, please refer to one of the manuals listed under (1).

GENERIC TERMS AND ABBREVIATIONS

Unless otherwise specified, the following generic terms and abbreviations are used in this manual to describe Type AJ65VBTCU-68ADVN/ADIN analog-digital converter module.

Generic Term/Abbreviation	Description
GX Developer	Product name of the software package for the MELSEC programmable controllers.
GX Works2	
ACPU	Generic term for A0J2HCPU, A1SCPU, A1SCPUC24-R2, A1SHCPU, A1SJCPU, A1SJCPU-S3, A1SJHCPU, A1NCPU, A2NCPU, A2NCPU-S1, A3NCPU, A2SCPU, A2SHCPU, A2ACPU, A2ACPU-S1, A3ACPU, A2UCPU, A2UCPU-S1, A2USCPU, A2USCHPU-S1, A2USHCPU-S1, A3UCPU and A4UCPU
QnACPU	Generic term for Q2ACPU, Q2ACPU-S1, Q2ASCPU, Q2ASCPU-S1, Q2ASHCPU, Q2ASHCPU-S1, Q3ACPU, Q4ACPU, Q4ARCPU
QCPU (A mode)	Generic term for Q02CPU-A, Q02HCPU-A, Q06HCPU-A
QCPU (Q mode)	Generic term for Q00JCPU, Q00CPU, Q01CPU, Q02CPU, Q02HCPU, Q06HCPU, Q12HCPU, Q25HCPU, Q02PHCPU, Q06PHCPU, Q12PHCPU, Q25PHCPU, Q12PRHCPU, Q25PRHCPU, Q00UJCPU,Q00UCPU,Q01UCPU,Q02UCPU, Q03UDCPU, Q04UDHCPU, Q06UDHCPU, Q10UDHCPU,Q13UDHCPU, Q20UDHCPU,Q26UDHCPU, Q03UDECPU, Q04UDEHCPU, Q06UDEHCPU, Q13UDEHCPU, Q26UDEHCPU,Q50UDEHCPU and Q100UDEHCPU
LCPU	Generic term for L02CPU, L26CPU-BT
Master station	Station that controls the data link system. One master station is required for each system.
Local station	Station having a programmable controller CPU and the ability to communicate with the master and other local stations.
Remote I/O station	Remote station that handles bit unit data only. (Performs input and output with external devices.) (AJ65BTB1-16D, AJ65SBTB1-16D)
Remote device station	Remote station that handles bit unit and word unit data only. (Performs input and output with external devices, and analog data exchange.)
Remote station	Generic term for remote I/O station and remote device station. (Controlled by the master station)
Intelligent device station	Station that can perform transient transmission, such as the AJ65BT-R2 (including local stations).
Master module	Generic term for modules that can be used as the master station.
Local module	Generic term for modules that can be used as the local station.
SB	Link special relay (for CC-Link) Bit unit information that indicates the module operating status and data link status of the master station/local station. (Expressed as SB for convenience)
SW	Link special register (for CC-Link) 16 bit unit information that indicates the module operating status and data link status of the master station/local station. (Expressed as SW for convenience)

Generic Term/Abbreviation	Description
RX	Remote input (for CC-Link) Information entered in bit units from the remote station to the master station. (Expressed as RX for convenience)
RY	Remote output (for CC-Link) Information output in bit units from the master station to the remote station. (Expressed as RY for convenience)
RWw	Remote register (Write area for CC-Link) Information output in 16-bit units from the master station to the remote device station. (Expressed as RWw for convenience)
RWr	Remote register (Read area for CC-Link) Information entered in 16-bit units from the remote device station to the master station. (Expressed as RWr for convenience)

PACKING LIST

This product consists of the following.

Model name	Product name	Quantity
AJ65VBTCU-68ADVN	Type AJ65VBTCU-68ADVN analog-digital converter module	1
	Type AJ65VBTCU-68ADVN/ADIN analog-digital converter module user's manual (hardware)	1
AJ65VBTCU-68ADIN	Type AJ65VBTCU-68ADIN analog-digital converter module	1
	Type AJ65VBTCU-68ADVN/ADIN analog-digital converter module user's manual (hardware)	1

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1 OVERVIEW

This user's manual explains the specifications, handling, programming methods and others of Type AJ65VBTCU-68ADVN analog-digital converter module (hereafter abbreviated to the "AJ65VBTCU-68ADVN") and Type AJ65VBTCU-68ADIN analog-digital converter module (hereafter abbreviated to the “AJ65VBTCU-68ADIN”) which is used as a remote device station of a CC-Link system.
In this manual, the AJ65VBTCU-68ADVN and AJ65VBTCU-68ADIN are generically referred to as the AJ65VBTCU-68ADVN/ADIN.
The AJ65VBTCU-68ADVN/ADIN converts the analog signals (voltage or current input) from the programmable controller’s external source to a 16-bit encoded binary data digital value.

For the explanation of this product, the conventional AJ65VBTCU-68ADV analog-digital converter module (hereafter abbreviated to the "AJ65VBTCU-68ADV") and AJ65VBTCU-68ADI analog-digital converter module (hereafter abbreviated to the "AJ65VBTCU-68ADI") are also described in some parts of this manual.
In this manual, the AJ65VBTCU-68ADV and AJ65VBTCU-68ADI are generically called the AJ65VBTCU-68ADV/ADI.

1.1 CC-Link Compatible Functions

This product supports the following CC-Link functions.

- Cyclic transmission
- Expanded cyclic transmission
- Interstation cable length lessening

1 - 1

1.2 Features

This section gives the features of the AJ65VBTCU-68ADVN/ADIN.

(1) Selection of model according to application

AJ65VBTCU-68ADVN ...Voltage input on all eight channels.
AJ65VBTCU-68ADIN ....Current input on all eight channels.

(2) High accuracy

This module performs A/D conversion at the accuracy of ±0.3% relative to the maximum value of the digital output value at the operating ambient temperature of 0 to 55°C, or at ±0.2% relative to the maximum value of the digital output value at the operating ambient temperature of 25±5°C.

(3) Input range selectable per channel

You can choose the analog input range per channel to change the I/O conversion characteristics.

(4) High resolution of 1/±4000

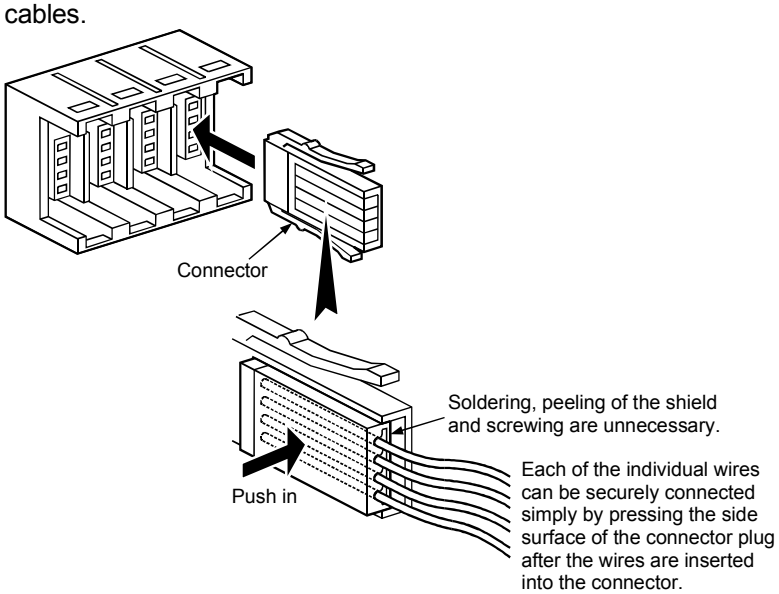
By changing the input range, you can choose and set the digital value resolution to either 1/4000 or 1/±4000 (Only AJ65VBTCU-68ADVN) to provide high-resolution digital values.

(5) Designation of sampling processing or average processing

As a conversion method, you can specify sampling processing or average processing per channel.

(6) Sharply reducible wiring man-hours

Wiring man-hours can be reduced sharply by adopting individual wire insulation displacement termination type one-touch connectors (no need for soldering, shield peeling and screwing) to connect the communication and power supply cables.

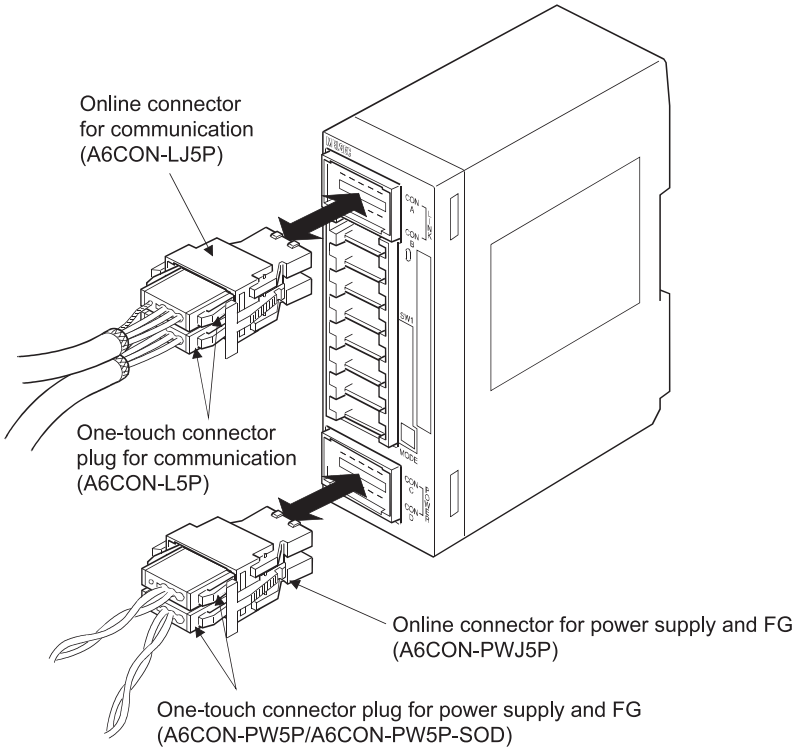

Connector
Soldering, peeling of the shield and screwing are unnecessary.
Push in
Each of the individual wires can be securely connected simply by pressing the side surface of the connector plug after the wires are inserted into the connector.

(7) Significant improvement of wiring performance

The above one-touch connectors for IN and OUT sides are plugged individually, greatly improving the performance of jumper wiring especially in an enclosure. (Mixed jumper wiring of the power supply cables with the I/O modules is not allowed.)

(8) Replacement of module without stopping CC-Link system

The use of the online connectors (for communication, for power supply) allows the module to be changed without the CC-Link system being stopped.



(9) Improved wiring workability

The connectors and setting switches are all front-mounted.
This enables connections to be made only by front wiring, improving wiring workability. It also allows setting to be made after installation to an enclosure.

(10) Compatibility with conventional modules

Complete compatibility with the conventional AJ65VBTCU-68ADV/ADI module has been achieved in the ver. 1 remote device station setting. (Refer to Section 4.4.)

(11) Selection of optimum mode for system

The optimum mode can be selected according to the system. (Refer to Section 4.4.)

Mode	Outline
Remote net ver. 2 mode	Select this mode when configuring a new system. The number of connected remote device stations can be increased to up to 42 in combination with the applicable master module.
Remote net additional mode	This module can be newly added to the existing system in combination with the applicable master module.
Remote net ver. 1 mode	Complete compatibility mode of the conventional remote net mode. Select this mode when system expansion is not necessary or when this module replaces the conventional one as a maintenance product.

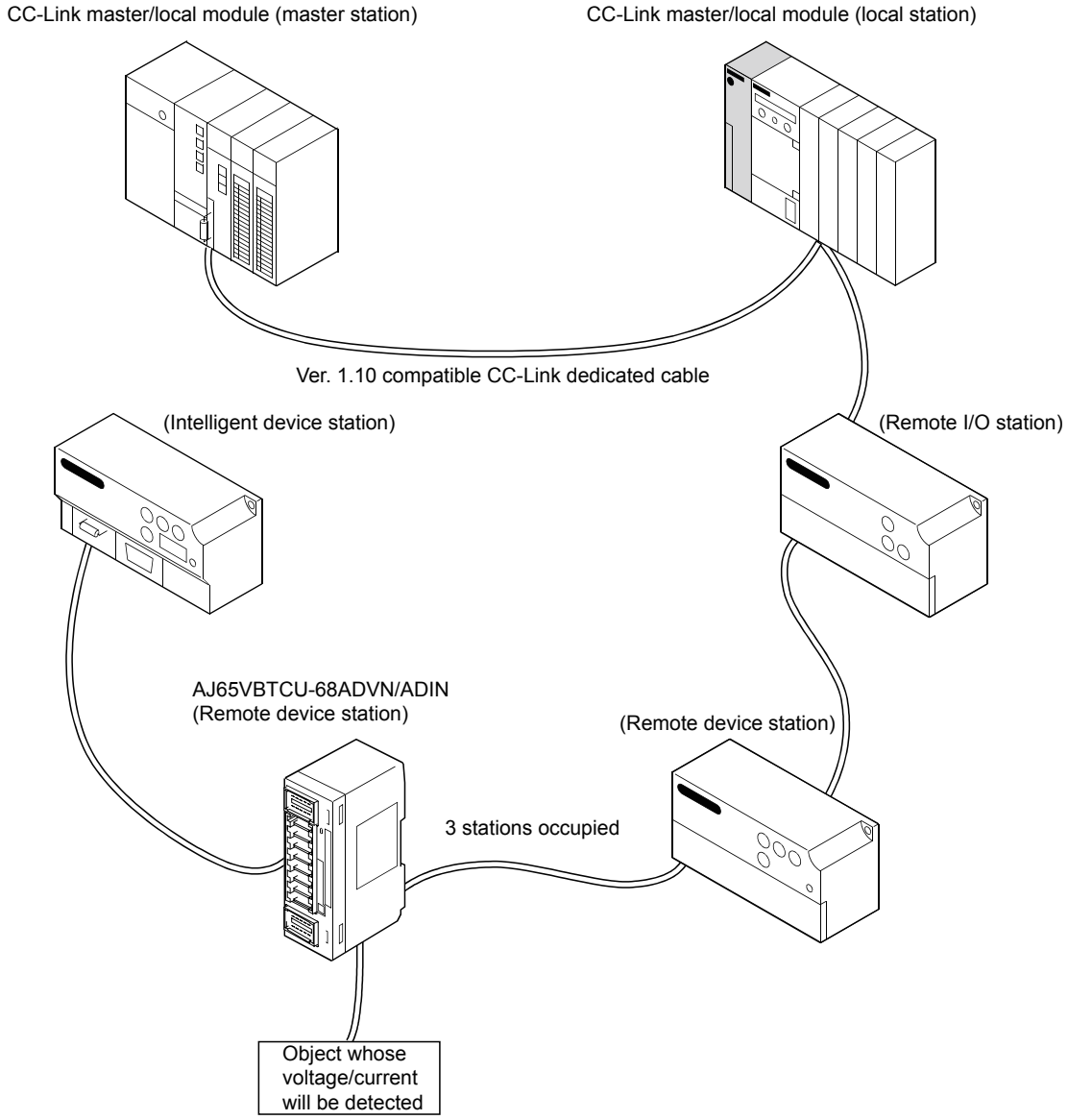
2 SYSTEM CONFIGURATION

This chapter describes the system configuration for use of the AJ65VBTCU-68ADVN/ADIN.

2.1 Overall Configuration

The overall configuration for use of the AJ65VBTCU-68ADVN/ADIN is shown below.

(1) Remote net ver. 1 mode



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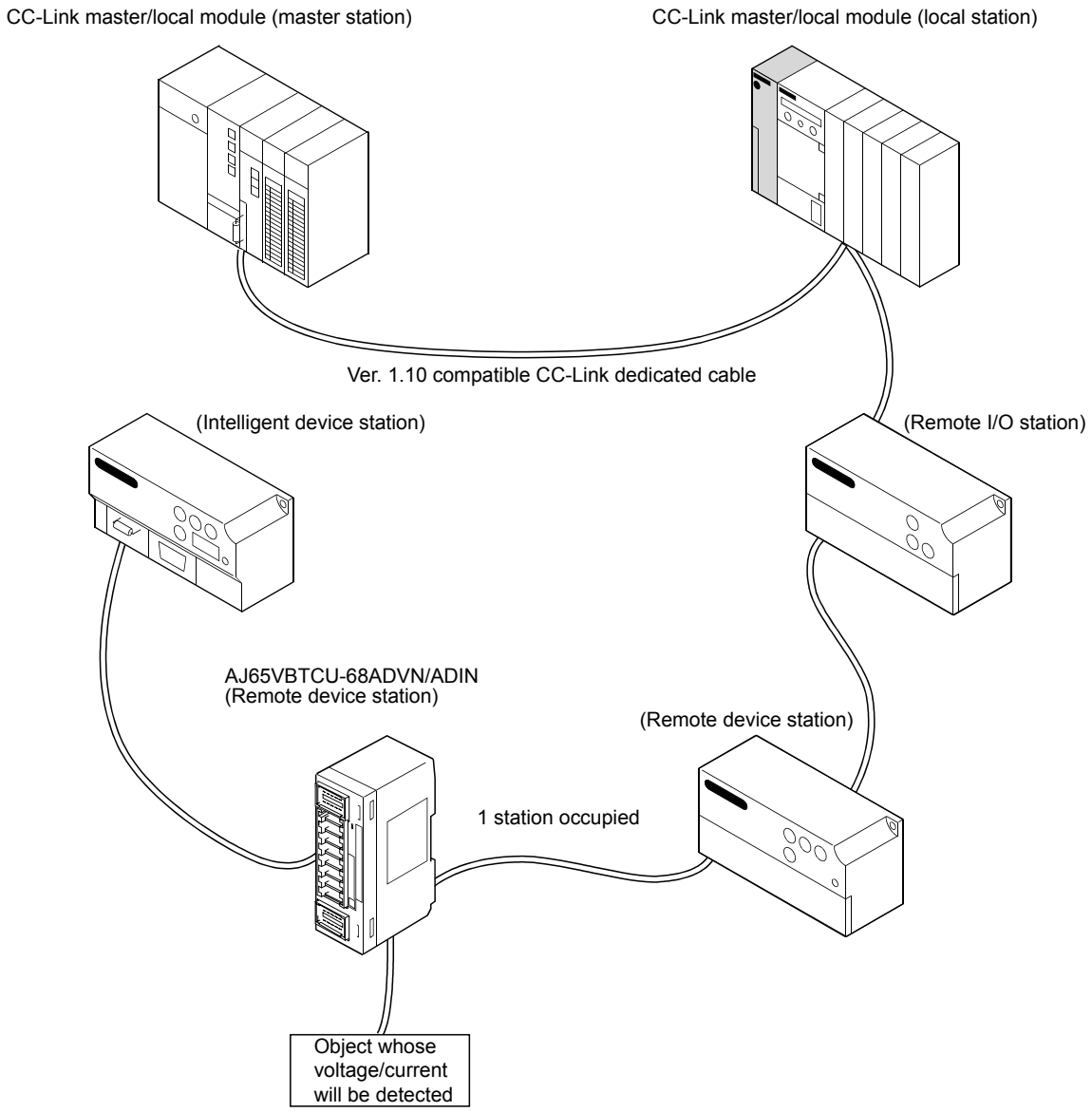
(2) Remote net ver. 2 mode, remote net additional mode



2.2 Applicable System

This section explains the applicable system.

(1) Applicable master modules

The following master modules can be used with the AJ65VBTCU-68ADVN/ADIN.

(a) For use in the remote net ver. 1 mode

- QJ61BT11N
- QJ61BT11
- AJ61BT11
- A1SJ61BT11
- AJ61QBT11
- A1SJ61QBT11

(b) For use in the remote net ver. 2 mode or remote net additional mode

- QJ61BT11N

(2) Applicable combinations

The following table indicates usability according to the combinations of the master modules, the mode setting and station information (station type) of the GX Developer network parameters, and the mode select switch setting of the module.

○: Usable, ×: Unusable

Master Module	Network Parameter Setting		Model Select Switch Setting ＊1 of AJ65VBTCU-68ADVN/ADIN	
	Mode setting	Station information (station type)	Ver. 1 remote device station (Ver. 1 compatible slave station)	Ver. 2 remote device station (Ver. 2 compatible slave station)
QJ61BT11 AJ61BT11 A1SJ61BT11 AJ61QBT11 A1SJ61QBT11	Remote net ver. 1 mode	Remote device station	○	×
	Remote net ver. 2 mode	Ver. 1 remote device station	×	×
		Ver. 2 remote device station		
	Remote net additional mode	Ver. 1 remote device station		
		Ver. 2 remote device station		
QJ61BT11N	Remote net ver. 1 mode	Remote device station	○	×
	Remote net ver. 2 mode	Ver. 1 remote device station	○	×
		Ver. 2 remote device station	×	○
	Remote net additional mode	Ver. 1 remote device station	○ ＊2	×
		Ver. 2 remote device station	×	○ ＊3

＊1 For details, refer to Section 4.3 and Section 4.4.

＊2 When there is a station number used as the ver. 2 remote device station in the existing system, set the station number of the ver. 1 remote device station to be added before that station.

＊3 Set the station number of the ver. 2 remote device station to be added after the station numbers used in the existing system.

POINT

For use in the remote net ver. 2 mode or remote net additional mode, the master module of QJ61BT11N and the peripheral software package of GX Developer Version 8.03D or later are required.
For more information on the applicable modules (CPU modules, network modules) and applicable software packages, refer to the CC-Link System Master/Local Module User's Manual (Details) QJ61BT11N.

(3) Restrictions on use of CC-Link dedicated instructions (RLPA, RRPA)

The CC-Link dedicated instructions may not be used depending on the programmable controller CPU and master module used.
For details of the restrictions, refer to the A series master module user's manual and the Type AnSHCPU/AnACPU/AnUCPU/QCPU-A (A Mode) Programming Manual (Dedicated Instructions).
This module does not allow the use of the dedicated instructions other than RLPA and RRPA.
Refer to Section 5.5 for a program example using the dedicated instructions (RLPA, RRPA).

2.3 Parts Sold Separately

Plugs for the AJ65VBTCU-68ADVN/ADIN are sold separately.
Please purchase them as necessary.

	Mitsubishi model name	Part model name (manufacturer)	Specifications			Color of the cover
			Applicable cable size (core)	Applicable cable size (diameter)	Maximum rated current	
Plug for one-touch connector ∗1, ∗4	A6CON-P214	33104-6000FL ∗5	0.14 to 0.2mm^2 (26 to 24 AWG)	ϕ 1.0 to 1.4mm	2A ∗7	Transparent
	A6CON-P220	33104-6100FL ∗5		ϕ 1.4 to 2.0mm		Yellow
	A6CON-P514	33104-6200FL ∗5	0.3 to 0.5mm^2 (22 to 20 AWG)	ϕ 1.0 to 1.4mm	3A ∗7	Red
	A6CON-P520	33104-6300FL ∗5		ϕ 1.4 to 2.0mm		Blue
One-touch connector plug for communication ∗2, ∗4	A6CON-L5P	35505-6000-BOM GF ∗5	Communication line 0.5mm^2 (20 AWG)	ϕ 2.2 to 3.0mm		Red
			Shielded cable 0.5mm^2 (20 AWG)			
One-touch connector for power supply and FG ∗2, ∗4, ∗6	A6CON-PW5P	35505-6080-A00 GF ∗5	0.75mm^2 (0.66 to 0.98mm^2) (18 AWG) Wire diameter: 0.16mm or more Insulating coating material: PVC (heat-resistant)	ϕ 2.2 to 3.0mm	7A ∗7	Gray
	A6CON-PW5P-SOD	35505-6180-A00 GF ∗5		ϕ 2.0 to 2.3mm		Blue
Online connector for communication ∗3	A6CON-LJ5P	35720-L200-B00 AK ∗5	—	—	—	—
Online connector for power supply and FG ∗3	A6CON-PWJ5P	35720-L200-A00 AK ∗5	—	—	—	—
One-touch connector plug with terminating resistor (including 1)	A6CON-TR11	—	One-touch connector plug with terminating resister attached for communication (110Ω)	—	—	—
One-touch connector plug with terminating resistor (1 piece)	A6CON-TR11	—	With terminating resistor (110Ω)		—	—
	A6CON-TR11N		With terminating resistor (110Ω) (built-in type)			

∗1 The A6CON-P□□□ (manufactured by Mitsubishi) are available in packs of 20 pieces.
∗2 The A6CON-□5P (manufactured by Mitsubishi) are available in packs of 10 pieces.
∗3 The A6CON-□J5P (manufactured by Mitsubishi) are available in packs of 5 pieces.
∗4 One-touch connector plugs can no longer be used once crimped.
∗5 The manufacturer is Sumitomo 3M Limited.
∗6 Check the outside diameter of an applicable cable and select a connector.
∗7 Keep the current within the allowable range of the connected cable.

REMARK

The following table indicates the connectors of this module with which the above plugs/connectors are compatible.

Connector of This Module	Compatible Optional Parts
One-touch connector for communication	• One-touch connector plug for communication • Online connector for communication • One-touch connector plug with terminating resistor
One-touch connector for power supply and FG	• One-touch connector plug for power supply and FG • Online connector for power supply and FG
One-touch connector for analog I/O	• Plug for one-touch connector

3 SPECIFICATIONS

This chapter provides the specifications of the AJ65VBTCU-68ADVN/ADIN.

3.1 General Specifications

Table 3.1 lists the general specifications of the AJ65VBTCU-68ADVN/ADIN.

Table 3.1 General specifications

Item	Specifications					
Operating ambient temperature	0 to 55°C					
Storage ambient temperature	-20 to 75°C					
Operating ambient humidity Storage ambient humidity	10 to 90%RH, no condensation					
Vibration resistance	Compliant with JIS B 3502 and IEC 61131-2		Frequency	Constant acceleration	Half amplitude	Sweep count
		Under intermittent vibration	5 to 8.4Hz	—	3.5mm	10 times each in X, Y and Z axis
			8.4 to 150Hz	9.8m/s^2	—	
		Under continuous vibration	5 to 8.4Hz	—	1.75mm	—
			8.4 to 150Hz	4.9m/s^2	—	
Shock resistance	Compliant with JIS B 3502 and IEC 61131-2 (147 m/s^2, 3 times each in 3 directions X, Y, Z)					
Operating atmosphere	No corrosive gases					
Operating altitude*3	0 to 2000m					
Installation location	Inside a control panel					
Overvoltage category*1	II or less					
Pollution degree*2	2 or less					

*1 This indicates the section of the power supply to which the equipment is assumed to be connected between the public electrical power distribution network and the machinery within premises.
Category II applies to equipment for which electrical power is supplied from fixed facilities. The surge voltage withstand level for up to the rated voltage of 300V is 2500V.

*2 This index indicates the degree to which conductive material is generated in terms of the environment in which the equipment is used.
Pollution level 2 is when only non-conductive pollution occurs. A temporary conductivity caused by condensing must be expected occasionally.

*3 Do not use or store the programmable controller under pressure higher than the atmospheric pressure of altitude 0m. Doing so may cause malfunction. When using the programmable controller under pressure, please consult your local Mitsubishi representative.

3.2 Performance Specifications

Table 3.2 lists the performance specifications of the AJ65VBTCU-68ADVN/ADIN.

Table 3.2 Performance specifications

<table>
<tr><td colspan="3">Item</td><td colspan="3">AJ65VBTCU-68ADVN</td><td colspan="3">AJ65VBTCU-68ADIN</td></tr>
<tr><td colspan="3">Protection degree</td><td colspan="6">IP1XB</td></tr>
<tr><td rowspan="2">Analog input</td><td>Voltage</td><td colspan="5">–10 to 0 to 10VDC (input resistance 1MΩ)</td><td colspan="3">—</td></tr>
<tr><td>Current</td><td colspan="5">—</td><td colspan="3">0 to 20mADC (input resistance 250Ω)</td></tr>
<tr><td colspan="3">Digital output</td><td colspan="5">16-bit signed binary (-4096 to 4095)</td><td colspan="3">16-bit signed binary (-96 to 4095)</td></tr>
<tr><td colspan="3">I/O characteristics, maximum resolution, overall accuracy (accuracy for the maximum digital output value)</td><td colspan="8"><table>
<tr><td rowspan="2"></td><td rowspan="2">Analog input range</td><td rowspan="2">Digital output</td><td colspan="2">Accuracy</td><td rowspan="2">Maximum resolution</td></tr>
<tr><td>Ambient temperature 0 to 55°C</td><td>Ambient temperature 25±5°C</td></tr>
<tr><td rowspan="5">AJ65VBTCU-68ADVN (Voltage)</td><td>-10 to 10V</td><td rowspan="2">-4000 to 4000</td><td rowspan="9">±0.3% (±12 digit*1)</td><td rowspan="9">±0.2% (±8 digit*1)</td><td>2.5mV</td></tr>
<tr><td>User range setting 1 (-10 to 10V)</td><td>1.25mV</td></tr>
<tr><td>0 to 5V</td><td rowspan="3">0 to 4000</td><td rowspan="2">1.0mV</td></tr>
<tr><td>1 to 5V</td></tr>
<tr><td>User range setting 2 (0 to 5V)</td></tr>
<tr><td rowspan="3">AJ65VBTCU-68ADIN (Current)</td><td>0 to 20mA</td><td rowspan="3">0 to 4000</td><td>5μA</td></tr>
<tr><td>4 to 20mA</td><td rowspan="2">4μA</td></tr>
<tr><td>User range setting (0 to 20mA)</td></tr>
</table></td></tr>
<tr><td colspan="3">Maximum conversion speed</td><td colspan="6">1ms/channel</td></tr>
<tr><td colspan="3">Absolute maximum input</td><td colspan="4">Voltage: ±15V</td><td colspan="4">Current : ±30mA*2</td></tr>
<tr><td colspan="3">Analog input points</td><td colspan="8">8 channels/module</td></tr>
<tr><td colspan="3">CC-Link station type</td><td colspan="8">Remote device station (ver. 1 remote device station or ver. 2 remote device station)</td></tr>
<tr><td colspan="3">Number of occupied stations</td><td colspan="8">Ver.1 remote device station (Ver.1 compatible slave station) setting:
3 stations (32 points for RX and RY, 12 points for RWr and RWw)
Ver.2 remote device station (Ver.2 compatible slave station) setting:
1 station (32 points for RX and RY, 16 points for RWr and RWw, expanded cyclic settings: 4 times)</td></tr>
<tr><td colspan="3">Communication cable</td><td colspan="8">Ver.1.10-compatible CC-Link dedicated cable: FANC-110SBH, FA-CBL200PSBH, CS-110</td></tr>
<tr><td colspan="3">Insulation</td><td colspan="8"><table>
<tr><td>Insulated area</td><td>Insulation method</td><td>Withstand voltage</td><td>Insulation resistance</td></tr>
<tr><td>Across communication system terminals and all analog input terminals</td><td>Photocoupler</td><td rowspan="2">500VAC for 1 minute</td><td rowspan="2">5MΩ or higher (500VDC insulation resistance tester)</td></tr>
<tr><td>Across power supply system terminals and all analog input terminals</td><td>Transformer</td></tr>
<tr><td>Between channels</td><td>Non-insulation</td><td>-</td><td>-</td></tr>
</table></td></tr>
<tr><td colspan="3">Noise immunity</td><td colspan="8">Noise voltage 500Vp-p, noise width 1μs, noise frequency 25 to 60Hz (DC type noise simulator condition)</td></tr>
<tr><td colspan="3">External connection system</td><td colspan="8">One-touch connector for communication [Transmission circuit]
(5-pin IDC plug is sold separately.)
One-touch connector for power supply and FG [Unit power supply, FG]
(5-pin IDC plug is sold separately.)
One-touch connector for analog I/O
(4-pin IDC plug is sold separately.)
<Sold separately>
Online connector for communication: A6CON-LJ5P
Online connector for power supply: A6CON-PWJ5P</td></tr>
<tr><td rowspan="3">Applicable wire size</td><td>One-touch connector for communication</td><td colspan="8">Communication line:
Ver. 1.10 compatible CC-Link dedicated cable: 0.5mm^2 (20 AWG) [ϕ2.2 to 3.0],
Shielded wire: 0.5mm^2 (20 AWG)</td></tr>
<tr><td>One-touch connector for power supply and FG</td><td colspan="8">0.66 to 0.98 mm^2 (18 AWG) [ϕ2.2 to 3.0mm],
Wire diameter: 0.16 mm or more</td></tr>
<tr><td>One-touch connector for analog I/O</td><td colspan="8">ϕ1.0 to 1.4 (A6CON-P214), ϕ1.4 to 2.0 (A6CON-P220) [Applicable cable size: 0.14 to 0.2 mm^2]
ϕ1.0 to 1.4 (A6CON-P514), ϕ1.4 to 2.0 (A6CON-P520) [Applicable cable size: 0.3 to 0.5 mm^2]</td></tr>
<tr><td colspan="2" rowspan="2">Applicable DIN rail</td><td colspan="8">TH35-7.5Fe, TH35-7.5Al (compliant with IEC 60715)</td></tr>
<tr><td colspan="8">CC-Link connector type metal installation fitting: A6PLT-J65V1</td></tr>
<tr><td colspan="2" rowspan="3">External power supply</td><td colspan="8">24VDC (20.4 to 26.4VDC, ripple ratio: within 5%)</td></tr>
<tr><td colspan="8">Inrush current: 4.2A, 1.2ms or less</td></tr>
<tr><td colspan="8">Current consumption: 0.10A (at 24VDC)</td></tr>
<tr><td colspan="2">Weight</td><td colspan="8">0.17kg</td></tr>
</table>

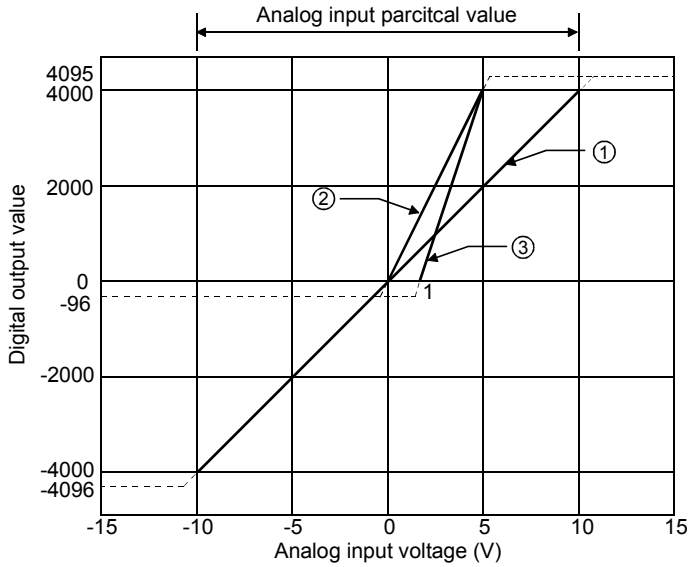
*1 digit indicates digital value.
*2 Current value indicates value of instant input current that does not break module inner electrical resistance.

3.3 I/O Conversion Characteristics

The I/O characteristics is the slope created by connecting the offset and gain values, with a straight line when converting the analog signals (voltage or current input) from an external source of the programmable controller to digital values.
The offset value is an analog input value (voltage or current) at which the digital output value is 0.
The gain value is an analog input value (voltage or current) at which the digital output value is 4000.

3.3.1 Voltage input characteristics of the AJ68VBTCU-68ADVN

The voltage input characteristic graph of the AJ65VBTCU-68ADVN is shown below.



Number	Analog Input Range Setting	Offset Value	Gain Value	Digital Output Value*	Maximum Resolution
1)	-10 to +10V	0V	10V	-4000 to +4000	2.5mV
2)	0 to 5V	0V	5V	0 to 4000	1.25mV
3)	1 to 5V	1V	5V		1.0mV
—	User range setting 1 (-10 to +10V)	0V	10V	-4000 to +4000	2.5mV
—	User range setting 2 (0 to 5V)	0V	5V	0 to 4000	1.0mV

Fig. 3.1 Voltage Input Characteristic of the AJ65VBTCU-68ADVN

POINT

(1) Do not input more than ±15V. The element may be damaged.

(2) If the analog input provided corresponds to the digital output value* beyond its range, the digital output value is fixed to the maximum or minimum.
- For 0 to 4000, the digital output value is within the range -96 to 4095.
- For -4000 to +4000, the digital output value is within the range -4096 to +4095.

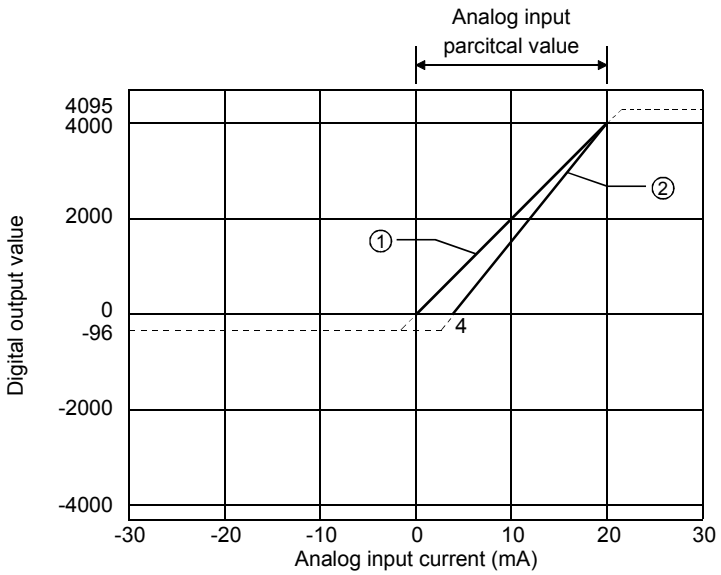
(3) Within the analog input and digital output scopes of each input range, the maximum resolution and accuracy are within the performance specification range. Outside those scopes, however, they may not fall within the performance specification range. (Avoid using the dotted line part in Fig. 3.1.)

(4) Set the offset and gain values of the user range setting within the range satisfying the following conditions.
(a) Setting range when user range setting 1 is selected: -10 to +10V
(b) Setting range when user range setting 2 is selected: 0 to 5V
(c) (Gain value) > (Offset value)

If you attempt to make setting outside the setting range of (a) or (b), the "RUN" LED flickers at 0.5s intervals.
Set the values within the setting range.
If you attempt to make setting outside the setting range of (c), the "RUN" LED flickers at 0.5s intervals.
Make setting again.

3.3.2 Current input characteristics of the AJ65VBTCU-68ADIN

The current input characteristic graph of the AJ65VBTCU-68ADIN is shown below.



Number	Analog Input Range Setting	Offset Value	Gain Value	Digital Output Value*	Maximum Resolution
1)	0 to 20mA	0mA	20mA	0 to 4000	5μA
2)	4 to 20mA	4mA	20mA		4μA
—	User range setting (0 to 20mA)	0mA	20mA		

Fig. 3.2 Current Input Characteristic of the AJ65VBTCU-68ADIN

POINT

(1) Do not input more than ±30mA. A breakdown may result due to heat increase.
(2) If the analog input provided corresponds to the digital output value* beyond its range, the digital output value is fixed to the maximum or minimum.
  • For 0 to 4000, the digital output value is within the range -96 to 4095.
(3) Within the analog input and digital output scopes of each input range, the maximum resolution and accuracy are within the performance specification range. Outside those scopes, however, they may not fall within the performance specification range. (Avoid using the dotted line part in Fig. 3.2.)
(4) Set the offset and gain values of the user range setting within the range satisfying the following conditions.
  (a) Setting range when user range setting is selected: 0 to 20mA
  (b) (Gain value) > (Offset value)

  If you attempt to make setting outside the setting range of (a), the "RUN" LED flickers at 0.5s intervals.
  Set the values within the setting range.
  If you attempt to make setting outside the setting range of (b), the "RUN" LED flickers at 0.5s intervals.
  Make setting again.

3.3.3 Relationship between the offset/gain setting and digital output value

The relationship between the offset/gain setting and digital output value is described.

(1) Resolution

The resolution is obtained by the following formula:

(a) For the AJ65VBTCU-68ADVN:

$$\text{Resolution} = \frac{\text{(Gain value) - (Offset value)}}{4000}$$

(b) For the AJ65VBTCU-68ADIN:

$$\text{Resolution} = \frac{\text{(Gain value) - (Offset value)}}{4000}$$

(2) Relationship between the maximum resolution and digital output value

The maximum resolution of the AJ65VBTCU-68ADVN/ADIN is as indicated in the performance specification.

If the following is satisfied from the offset/gain setting, the digital output value does not increases /decreases by one.

$$\frac{\text{(Gain value) - (Offset value)}}{4000} < \text{Maximum resolution}$$

3.3.4 Accuracy

Accuracy is relative to the maximum value of the digital output value.

If you change the offset/gain setting or input range to change the input characteristic, accuracy does not change and is held within the range indicated in the performance specifications.

Accuracy is within ±0.2% (±8 digit) at the operating ambient temperature of 25±5°C or within ±0.3% (±12 digit) at the operating ambient temperature of 0 to 55°C.

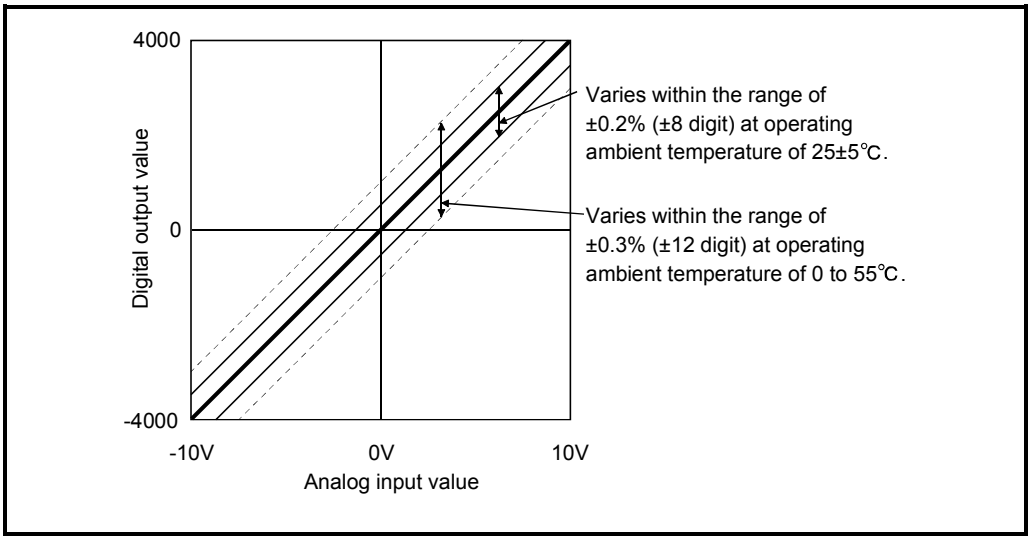

4000
0
-4000
Digital output value
-10V
0V
10V
Analog input value
Varies within the range of ±0.2% (±8 digit) at operating ambient temperature of 25±5℃.
Varies within the range of ±0.3% (±12 digit) at operating ambient temperature of 0 to 55℃.

Fig. 3.3 Accuracy of AJ65VBTCU-68ADVN

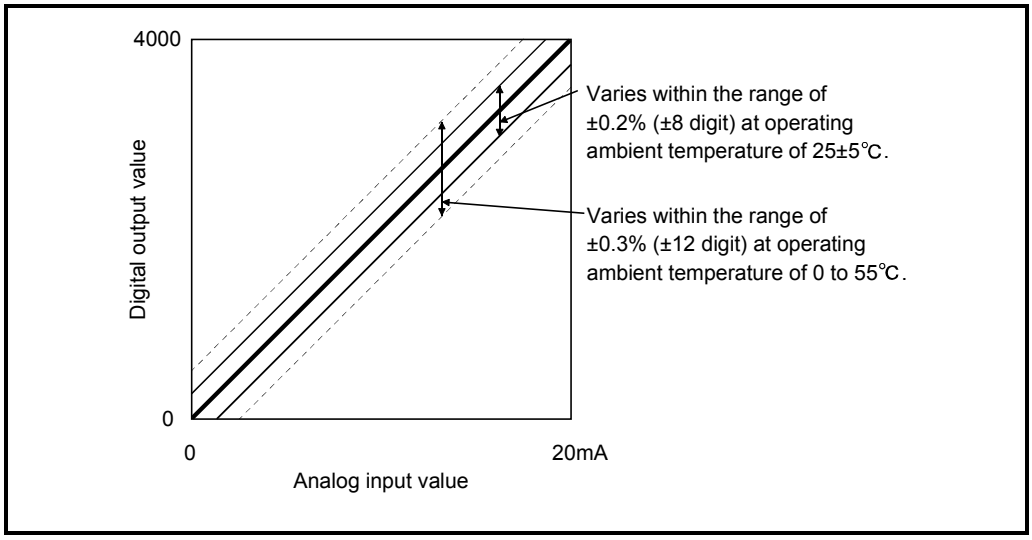


Fig. 3.4 Accuracy of AJ65VBTCU-68ADIN

3.3.5 Conversion speed

Conversion speed indicates time from channel changing to A/D conversion completion.
Conversion speed per channel of the AJ65VBTCU-68ADVN/ADIN is 1ms.
Due to the data link processing time of the CC-Link system, there is a transmission delay until the A/D conversion value is read actually.
For the data link processing time, refer to the user's manual of the master module used.

Example1) Ver. 1 remote device station (ver. 1 compatible slave station) setting
Data link processing time taken in the asynchronous mode when the master module is the QJ61BT11 (normal value)

[Calculation expression]

SM+LS×1+remote device station processing time
SM : Scan time of master station sequence program
LS : Link scan time
Remote device station processing time: (Number of channels used+1＊) × 1ms

＊: Internal processing time of AJ65VBTCU-68ADVN/ADIN

Example2) Ver. 2 remote device station (ver. 2 compatible slave station) setting
Data link processing time taken in the asynchronous mode when the master module is the QJ61BT11N (normal value)

[Calculation expression]

(a) In the case of the remote input (RX), remote register (RWw)
SM + LS × 1 × m + remote device station processing time

(b) In the case of the remote output (RY), remote register (RWr)
SM + LS × 1 × (m + 1) + remote device station processing time
SM : Scan time of master station sequence program
LS : Link scan time
m : Constant＊1
Remote device station processing time: (Number of channels used + 1＊2) × 1ms

＊1: Expanded cyclic setting is quadruple in this module, m = 7.
＊2: Internal processing time of AJ65VBTCU-68ADVN/ADIN

3.4 Function List

The AJ65VBTCU-68ADVN/ADIN function list is shown in table 3.3.

Table 3.3 AJ65VBTCU-68ADVN/ADIN function list

<table>
<tr><th>Item</th><th>Description</th><th>Refer to</th></tr>
<tr><td>Sampling processing</td><td>Perform A/D conversion of an analog input value one by one and store the result into the remote register each time.</td><td>Section 3.4.1
Section 3.6.4</td></tr>
<tr><td>Average processing</td><td>Perform A/D conversion by the preset number of times or for a preset time on the channel specified for average processing, and store the result into the remote register.</td><td>Section 3.4.2
Section 3.6.4</td></tr>
<tr><td>A/D conversion enable/prohibit specification</td><td>Specify whether A/D conversion is enabled or disabled per channel.
By prohibiting the conversion for the channels which are not used, the sampling time can be shortened.</td><td>Section 3.6.2</td></tr>
<tr><td>Input range changing function</td><td>Can set the analog input range per channel to change the I/O conversion characteristics.
Select the input range setting from among the following 8 types.
<table>
<tr><th></th><th>Input Range</th><th>Set Value</th></tr>
<tr><td rowspan="5">AJ65VBTCU-68ADVN</td><td>-10 to +10V</td><td>0H</td></tr>
<tr><td>0 to 5V</td><td>1H</td></tr>
<tr><td>1 to 5V</td><td>2H</td></tr>
<tr><td>User range setting 1
(-10 to +10V)</td><td>3H</td></tr>
<tr><td>User range setting 2
(0 to 5V)</td><td>4H</td></tr>
<tr><td rowspan="3">AJ65VBTCU-68ADIN</td><td>4 to 20mA</td><td>0H</td></tr>
<tr><td>0 to 20mA</td><td>1H</td></tr>
<tr><td>User range setting
(0 to 20mA)</td><td>2H</td></tr>
</table></td><td>Section 3.6.3</td></tr>
<tr><td>Offset/gain setting</td><td>The offset/gain setting can be performed volumeless for each channel, and the I/O conversion characteristics can be changed.</td><td>Section 4.4</td></tr>
</table>

3.4.1 Sampling processing

The A/D conversion is performed successively for the analog input, and the converted digital output values are stored in the remote register.
The processing time to store the digital output value into the remote register after the sampling processing differs depending on the number of A/D conversion enabled channels.

(Processing time) = Number of A/D conversion enabled channels) × 1 (ms)
↑
Maximum conversion speed

[Example] When three channels, channels 1, 2, and 3 are enabled for conversion:
3×1 = 3 (ms)

3.4.2 Average processing

The AJ65VBTCU-68ADVN/ADIN performs A/D conversion to the channel(s) for the average processing specified by the programmable controller CPU for the set number of times or for the set time. The average is then obtained from the total value excluding the maximum and minimum values, and stored in the remote register. When the number of processing is two times or less, the sampling processing is performed. When the A/D conversion enable/prohibit setting is performed, the average processing is initialized.

(1) When the average processing specification is made for time

- Set the time in 1 ms modules.
- The number of times for processing for the set time depends on the number of A/D conversion enabled channels.

$$\text{(Number of times for processing)} = \frac{\text{Set time}}{\text{(Number of A/D conversion enabled channels)} \times 1\ \text{(ms)}}$$

↑
Maximum conversion speed

[Example] When the number of A/D conversion enabled channels is two, and the set time is 1000 ms:
1000/(2 × 1)=500 times

(2) When the average processing specification is made for the number of times

The processing time to store the average value (average of number of times) into the remote register depends on the number of A/D conversion enabled channels.

(Processing time) = (Set number of times) × (Number of A/D conversion enabled channels) × 1 (ms)
↑
Maximum conversion speed

[Example] When two channels, channels 1 and 3 are A/D conversion enabled, and the set number of times is 500:
500 × 2 × 1=1000 (ms)

3.5 Remote I/O Signals

This section describes the assignment and functions of the remote I/O signals.

3.5.1 Remote I/O signal list

Remote inputs (RX) mean the input signals from the AJ65VBTCU-68ADVN/ADIN to the master module, and remote outputs (RY) mean the output signals from the master module to the AJ65VBTCU-68ADVN/ADIN.
In communications with the master station, the AJ65VBTCU-68ADVN/ADIN uses 32 points of the remote inputs (RX) and 32 points of the remote outputs (RY).
The number of stations occupied by this module differs between ver. 1 remote device station (ver. 1 compatible slave station) setting and ver. 2 remote device station (ver. 2 compatible slave station) setting.
3 stations are occupied in the case of ver. 1 remote device station (ver. 1 compatible slave station) setting. The latter 64 points are not used.
1 station is occupied in the case of ver. 2 remote device station (ver. 2 compatible slave station) setting. Expanded cyclic setting is fixed to quadruple and the latter 32 points are not used.

(1) Remote I/O signal list for ver. 1 remote device station (ver. 1 compatible slave station) setting

Table 3.4 indicates the assignment and names of the remote I/O signals for ver. 1 remote device station (ver. 1 compatible slave station) setting.

Table 3.4 Remote I/O Signal List for Ver. 1 Remote Device Station (Ver. 1 Compatible Slave Station) Setting

Signal direction: AJ65VBTCU-68ADVN/ADIN → Master Module		Signal direction: Master Module → AJ65VBTCU-68ADVN/ADIN	
Remote input (RX)	Signal name	Remote output (RY)	Signal name
RXn0	CH.1 A/D conversion completion flag	RYn0 to RY(n+1)7	Reserved
RXn1	CH.2 A/D conversion completion flag		
RXn2	CH.3 A/D conversion completion flag		
RXn3	CH.4 A/D conversion completion flag		
RXn4	CH.5 A/D conversion completion flag		
RXn5	CH.6 A/D conversion completion flag		
RXn6	CH.7 A/D conversion completion flag		
RXn7	CH.8 A/D conversion completion flag		
RXn8 to RXnB	Reserved		
RXnC	E^2PROM write error flag		
RXnD to RX(n+1)7	Reserved		
RX(n+1)8	Initial data processing request flag	RY(n+1)8	Initial data processing completion flag
RX(n+1)9	Initial data setting completion flag	RY(n+1)9	Initial data setting request flag
RX(n+1)A	Error status flag	RY(n+1)A	Error reset request flag
RX(n+1)B	Remote READY	RY(n+1)8 to RY(n+5)F	Reserved
RX(n+1)C to RX(n+5)F	Reserved		

POINT

The reserved devices given in Table 3.4 are used by the system and cannot be used by the user.
If the user has used (turned on/off) any of them, we cannot guarantee the functions of the AJ65VBTCU-68ADVN/ADIN.

(2) Remote I/O signal list for ver. 2 remote device station (ver. 2 compatible slave station) setting

Table 3.5 indicates the assignment and names of the remote I/O signals for ver. 2 remote device station (ver. 2 compatible slave station) setting.

Table 3.5 Remote I/O Signal List for Ver. 2 Remote Device Station (Ver. 2 Compatible Slave Station) Setting

Signal direction: AJ65VBTCU-68ADVN/ADIN → Master Module		Signal direction: Master Module → AJ65VBTCU-68ADVN/ADIN	
Remote input (RX)	Signal name	Remote output (RY)	Signal name
RXn0	CH.1 A/D conversion completion flag	RYn0 to RY(n+1)7	Reserved
RXn1	CH.2 A/D conversion completion flag		
RXn2	CH.3 A/D conversion completion flag		
RXn3	CH.4 A/D conversion completion flag		
RXn4	CH.5 A/D conversion completion flag		
RXn5	CH.6 A/D conversion completion flag		
RXn6	CH.7 A/D conversion completion flag		
RXn7	CH.8 A/D conversion completion flag		
RXn8 to RXnB	Reserved		
RXnC	E^2PROM write error flag		
RXnD to RX(n+1)7	Reserved		
RX(n+1)8	Initial data processing request flag	RY(n+1)8	Initial data processing completion flag
RX(n+1)9	Initial data setting completion flag	RY(n+1)9	Initial data setting request flag
RX(n+1)A	Error status flag	RY(n+1)A	Error reset request flag
RX(n+1)B	Remote READY	RY(n+1)8 to RY(n+3)F	Reserved
RX(n+1)C to RX(n+3)F	Reserved		

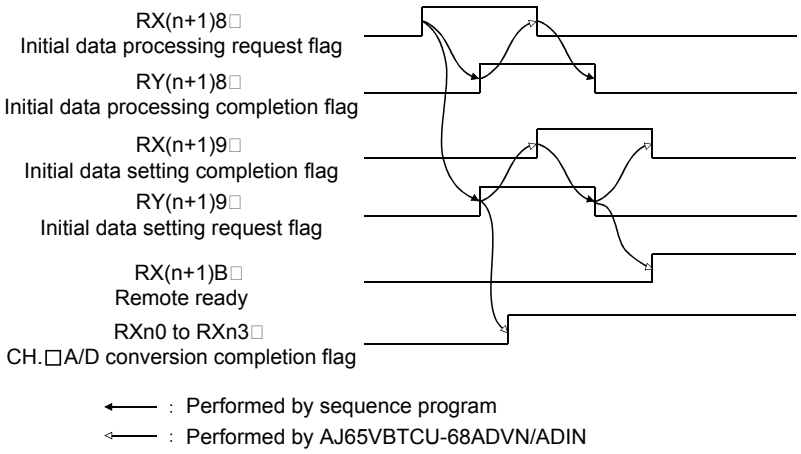
POINT

The reserved devices given in Table 3.5 are used by the system and cannot be used by the user.
If the user has used (turned on/off) any of them, we cannot guarantee the functions of the AJ65VBTCU-68ADVN/ADIN.

3.5.2 Functions of the remote I/O signals

Table 3.6 explains the functions of the remote I/O signals of the AJ65VBTCU-68ADVN/ADIN.

Table 3.6 Remote I/O Signal Details (1/2)

Device No.	Signal Name	Description
RXn0 to RXn7	CH.□ A/D Conversion completion flag	The A/D conversion completion flag turns on at completion of the A/D conversion of the corresponding channel when the initial data setting request flag (RY(n+1)9) turns from off to on after power-on. The A/D conversion completion flag processing is processed only once when the A/D conversion enable/prohibit specification is changed. • When changing the A/D conversion from prohibit to enable: When the average processing is specified, the flag turns on after completing the average processing of the number of times or time, and storing the A/D conversion digital value in the remote register. • When changing the A/D conversion from enable to prohibit: The corresponding channel's A/D conversion completion flag turns off.
RXnC	E^2PROM write error flag	Turns on if the number of E^2PROM write times exceeds its limit (100,000 times per channel). If this flag has turned on, this module itself has failed (hardware fault) and therefore this flag cannot be reset (turned off) by the error reset request flag. At occurrence of this error, power on the AJ65VBTCU-68ADVN/ADIN again. If this flag turns on after the power is switched on again, it is a hardware fault. Contact your nearest Mitsubishi representative.
RX(n+1)8	Initial data processing request flag	After power-on, the initial data processing request flag is turned on by the AJ65VBTCU-68ADVN/ADIN to request the initial data to be set. Also, after the initial data processing is complete (initial data processing completion flag RY(n+1)8 ON), the flag is turned off. 
RX(n+1)9	Initial data setting completion flag	When the initial data setting request (RY(n+1)9 ON) is made, the flag turns on after the initial data setting completion is done. Also, after the initial data setting is complete, the initial data setting completion flag turns off when the initial data setting request flag turns off.

n: Address allocated to the master module by the station number setting.

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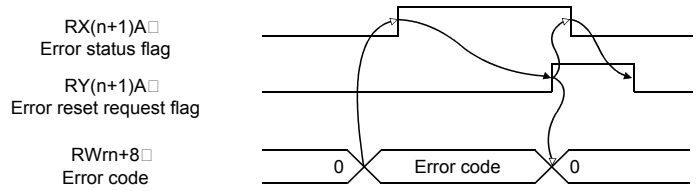
Table 3.6 Remote I/O Signal Details (2/2)

Device No.	Signal Name	Description
RX(n+1)A	Error status flag	Turns on at occurrence of an input range setting error, average time/number of times setting error or E^2PROM write error (RXnC). Does not turn on at occurrence of the watchdog timer error. ("RUN" LED goes off.)  : Performed by sequence program : Performed by AJ65VBTCU-68ADVN/ADIN
RX(n+1)B	Remote READY	Turns on when initial data setting is completed after power-on or at termination of the test mode. (Used for interlocking read/write from/to the master module.)
RY(n+1)8	Initial data processing completion flag	Turns on after initial data processing completion when initial data processing is requested after power-on or test mode operation.
RY(n+1)9	Initial data setting request flag	Turns on at the time of initial data setting or changing.
RY(n+1)A	Error reset request flag	When this flag turns on, the error status flag (RX(n+1)A) is reset, but the E^2PROM write error flag (RXnC) cannot be rest and therefore the error status flag remains on.

n: Address allocated to the master module by the station number setting.

3.6 Remote Register

The AJ65VBTCU-68ADVN/ADIN has a remote resister for data communication with the master module. The remote register allocation and data structures are described.

3.6.1 Remote register allocation

(1) Remote register assignment for ver. 1 remote device station (ver. 1 compatible slave station) setting

Table 3.7 indicates the remote register assignment for ver. 1 remote device station (ver. 1 compatible slave station) setting.

Table 3.7 Remote Register Assignment for Ver. 1 Remote Device Station (Ver. 1 Compatible Slave Station) Setting

Communication direction	Address	Description	Default value	Reference section
Master → Remote	RWwm+0H	A/D conversion enable/prohibit specification	0	Section 3.6.2
	RWwm+1H	CH.1 to 4 input range setting	0	Section 3.6.3
	RWwm+2H	CH.5 to 8 input range setting	0	
	RWwm+3H	Average processing specification	0	Section 3.6.4
	RWwm+4H	CH.1 average time, number of times setting	0	Section 3.6.5
	RWwm+5H	CH.2 average time, number of times setting	0	
	RWwm+6H	CH.3 average time, number of times setting	0	
	RWwm+7H	CH.4 average time, number of times setting	0	
	RWwm+8H	CH.5 average time, number of times setting	0	
	RWwm+9H	CH.6 average time, number of times setting	0	
	RWwm+AH	CH.7 average time, number of times setting	0	
	RWwm+BH	CH.8 average time, number of times setting	0	
Remote → Master	RWrn+0H	CH.1 digital output value	0	Section 3.6.6
	RWrn+1H	CH.2 digital output value	0	
	RWrn+2v	CH.3 digital output value	0	
	RWrn+3H	CH.4 digital output value	0	
	RWrn+4H	CH.5 digital output value	0	
	RWrn+5H	CH.6 digital output value	0	
	RWrn+6H	CH.7 digital output value	0	
	RWrn+7H	CH.8 digital output value	0	
	RWrn+8H	Error code	0	Section 3.6.7
	RWrn+9H to RWrn+BH	Reserved	0	——

m, n: Address allocated to the master module by the station number setting.

POINT

Do not read or write data from or to the reserved area of the remote register. If data is read or written, we cannot guarantee the functions of the AJ65VBTCU-68ADVN/ADIN.

(2) Remote register assignment for ver. 2 remote device station (ver. 2 compatible slave station) setting

Table 3.8 indicates the remote register assignment for ver. 2 remote device station (ver. 2 compatible slave station) setting.

Table 3.8 Remote Register Assignment for Ver. 2 Remote Device Station (Ver. 2 Compatible Slave Station) Setting

Communication direction	Address	Description	Default value	Reference section
Master → Remote	RWwm+0H	A/D conversion enable/prohibit specification	0	Section 3.6.2
	RWwm+1H	CH.1 to 4 input range setting	0	Section 3.6.3
	RWwm+2H	CH.5 to 8 input range setting	0	
	RWwm+3H	Average processing specification	0	Section 3.6.4
	RWwm+4H	CH.1 average time, number of times setting	0	Section 3.6.5
	RWwm+5H	CH.2 average time, number of times setting	0	
	RWwm+6H	CH.3 average time, number of times setting	0	
	RWwm+7H	CH.4 average time, number of times setting	0	
	RWwm+8H	CH.5 average time, number of times setting	0	
	RWwm+9H	CH.6 average time, number of times setting	0	
	RWwm+AH	CH.7 average time, number of times setting	0	
	RWwm+BH	CH.8 average time, number of times setting	0	
	RWwm+CH to RWwm+FH	Reserved	0	——
Remote → Master	RWrn+0H	CH.1 digital output value	0	Section 3.6.6
	RWrn+1H	CH.2 digital output value	0	
	RWrn+2v	CH.3 digital output value	0	
	RWrn+3H	CH.4 digital output value	0	
	RWrn+4H	CH.5 digital output value	0	
	RWrn+5H	CH.6 digital output value	0	
	RWrn+6H	CH.7 digital output value	0	
	RWrn+7H	CH.8 digital output value	0	
	RWrn+8H	Error code	0	Section 3.6.7
	RWrn+9H to RWrn+FH	Reserved	0	——

m, n: Address allocated to the master module by the station number setting.

POINT

Do not read or write data from or to the reserved area of the remote register. If data is read or written, we cannot guarantee the functions of the AJ65VBTCU-68ADVN/ADIN.

3.6.2 A/D conversion enable/prohibit specification (Address RWwm+0H)

(1) Set whether A/D conversion is enabled or disabled per channel.

(2) By setting the unused channels to conversion prohibit, the sampling cycle can be shortened.

Example) The sampling cycle when only channels 1 and 3 are set to A/D conversion enabled:

2 (Number of channels enabled) × 1ms (Conversion speed at one channel) = 2ms

(3) Operation is performed according to the setting made for the leading edges of initial data setting request flag (RY(n+1)9).

(4) The default setting is A/D conversion disable for all channels.

b15	b14	b13	b12	b11	b10	b9	b8	b7	b6	b5	b4	b3	b2	b1	b0
—	—	—	—	—	—	—	—	CH.8	CH.7	CH.6	CH.5	CH.4	CH.3	CH.2	CH.1
Ignored								1: Enable A/D conversion 0: Prohibit A/D conversion							

(5) AJ65VBTCU-68ADVN/ADIN processing when conversion is enabled/prohibited

(a) Average processing initialization

The data in the work area stored by the AJ65VBTCU-68ADVN/ADIN system to perform the average processing is initialized.
For example, at a channel with the average processing specification at 50 times, if the conversion enable/prohibit is set after having completed sampling for 30 times, the 30 sampling data is all cleared, and then the average processing is performed from the initial state.

(b) A/D conversion completion flag processing

The A/D conversion completion flag processing is performed only once when the A/D conversion enable/prohibit setting is changed.

- When changed the A/D conversion from prohibit to enabled:
  When the average processing is specified, the flag turns on after performing the average processing for the number of time or time and storing the A/D conversion digital value in the remote register.
- When changed the A/D conversion from enabled to prohibited:
  The A/D conversion completion flag for the corresponding channel is turned off.

3.6.3 CH. □ input range setting (Address RWwm+1H, RWwm+2H)

(1) Set the analog input range per channel.

(2) Operation is performed according to the setting made for the leading edges of the initial data setting request flag (RY(n+1)9).

(3) The default is as follows.
AJ65VBTCU-68ADVN : -10 to +10V
AJ65VBTCU-68ADIN : 4 to 20mA

	b15 to b12	b11 to b8	b7 to b4	b3 to b0
RWwm+1	CH.4	CH.3	CH.2	CH.1
RWwm+2	CH.8	CH.7	CH.6	CH.5

	Input Range	Set Value
AJ65VBTCU-68ADVN	-10 to +10V	0H
	0 to 5V	1H
	1 to 5V	2H
	User range setting 1 (-10 to +10V)	3H
	User range setting 2 (0 to 5V)	4H
AJ65VBTCU-68ADIN	4to 20mA	0H
	0 to 20mA	1H
	User range setting (0 to 20mA)	2H

POINT

If the set value is outside the setting range, error "20□＊" occurs, the "RUN" LED flickers at intervals of 0.1s, and all channels do not make A/D conversion.

＊□ indicates the channel No. where the error occurred.

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3.6.4 Average processing specification (Address RWwm+3H)

(1) Selects between sampling processing and average processing selection and when average processing is selected, the processing method is specified.

(2) The default is sampling processing on all channels.

b15	b14	b13	b12	b11	b10	b9	b8	b7	b6	b5	b4	b3	b2	b1	b0
CH.8	CH.7	CH.6	CH.5	CH.4	CH.3	CH.2	CH.1	CH.8	CH.7	CH.6	CH.5	CH.4	CH.3	CH.2	CH.1

Average processing channel specification
1: Average processing
0: Sampling processing

Time/number of times specification
1: Average time
0: Average number of times

(3) Operation of average processing specification is performed according to the setting made for the leading edges of the initial data setting request flag (RY(n+1)9).

POINT

(1) When performing an average processing specification, the average number of processing or time must be set.
(2) When the average processing specification is not performed, the sampling processing is performed regardless of the time/number of times setting.

3.6.5 CH. □ Average time/number of times setting (Address RWwm+4H to RWwm+BH)

(1) On each channel specified for average processing, the average time or average number of times is written to the address corresponding to the channel at the remote register address RWwm+4H to RWwM+BH.
At power-on, the average time and average number of times are 0.

(2) The setting ranges are as follows.
Number of times-based average processing: 1 to 10000 times
Time-based average processing: 4 to 10000ms

(3) Operation is performed according to the setting made for the leading edges of the initial data setting request flag (RY(n+1)9).

POINT

If the set value written is outside the above range, the corresponding channel results in error "10□*, 11□*" and performs A/D conversion processing using the average time/number of times used prior to error occurrence.

* □ indicates the channel No. where the error occurred.

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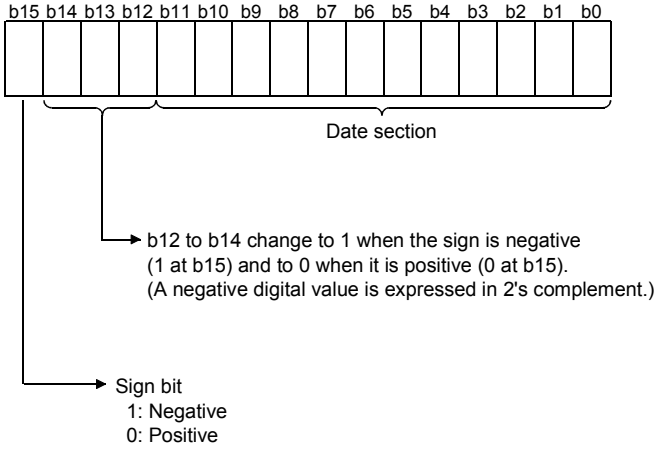
3.6.6 CH. □ Digital output value (Address RWrn+0H to RWrn+7H)

(1) The digital value after the A/D conversion is stored in the remote register address from RWrn+0H to RWrn+7H for each channel.

(2) The digital output value is expressed in a 16-bit encoded binary.


b15 b14 b13 b12 b11 b10 b9 b8 b7 b6 b5 b4 b3 b2 b1 b0
Date section
b12 to b14 change to 1 when the sign is negative
(1 at b15) and to 0 when it is positive (0 at b15).
(A negative digital value is expressed in 2's complement.)
Sign bit
1: Negative
0: Positive

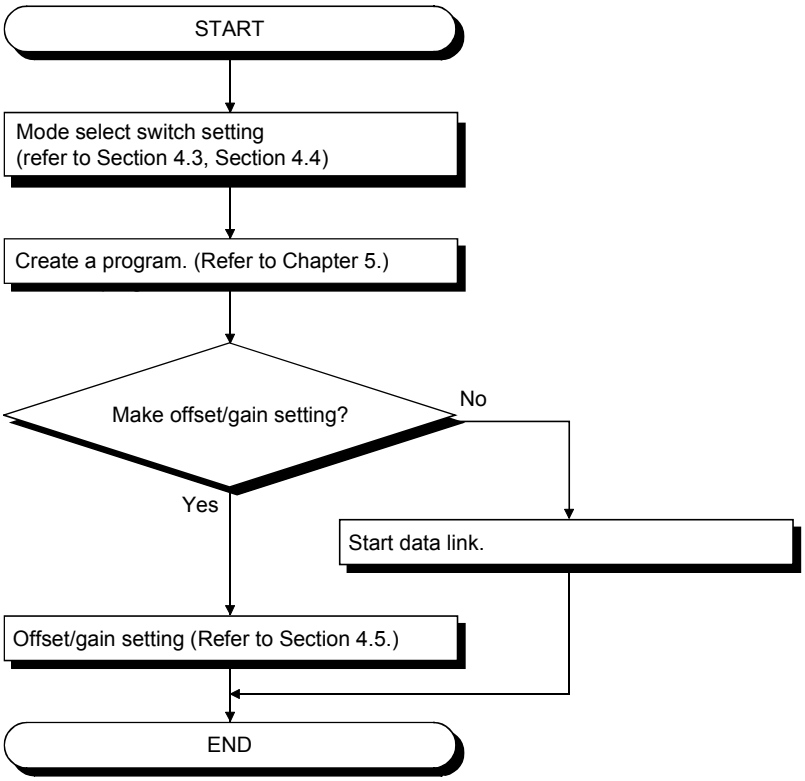
3.6.7 Error code (Address RWrn+8H)

If an error occurs (the RUN LED flickers) when data is written to the AJ65VBTCU-68ADVN/ADIN, the corresponding error code is stored into the remote register (address RWrn+8H) of the AJ65VBTCU-68ADVN/ADIN.
Refer to Section 6.1 for details of the error codes.

4 SETUP AND PREPARATION BEFORE OPERATION

4.1 Pre-Operation Procedure

This section explains the preparatory procedure for operating the AJ65VBTCU-68ADVN/ADIN.



4.2 Precautions When Handling

The precautions when handling the AJ65VBTCU-68ADVN/ADIN are described below:

⚠CAUTION

- Do not touch the pins while power is on. Doing so can cause a malfunction.
- Ensure that no foreign matter such as chips and wire-offcuts enter the module. Foreign matter can cause a fire, failure or malfunction.
- Do not disassemble or modify the module. Doing so can cause a failure, malfunction, injury or fire.
- Do not touch the conductive and electronic parts of the module directly. Doing so can cause the module to malfunction or fail.

⚠CAUTION

- Dispose of the product as industrial waste.
- Use the module in the environment indicated in the general specifications given in this manual.
  Not doing so can cause an electric shock, fire, malfunction, product damage or deterioration.
- Securely fix the module to a DIN rail or securely fix it with the CC-Link connector type fitting.
  Not doing so can cause a drop or malfunction.
- Mount or dismount the module to or from an enclosure after switching power off externally in all phases. Not doing so can cause the module to fail or malfunction.
- Always make sure to touch the grounded metal to discharge the electricity charged in the body, etc., before touching the module.
  Failure to do so may cause a failure or malfunctions of the module.

(1) When using the DIN rail adapter, install the DIN rail by making sure of the following:
  (a) Applicable DIN rail models (conforming to the JIS C 2812)
    TH35-7.5Fe
    TH35-7.5Al

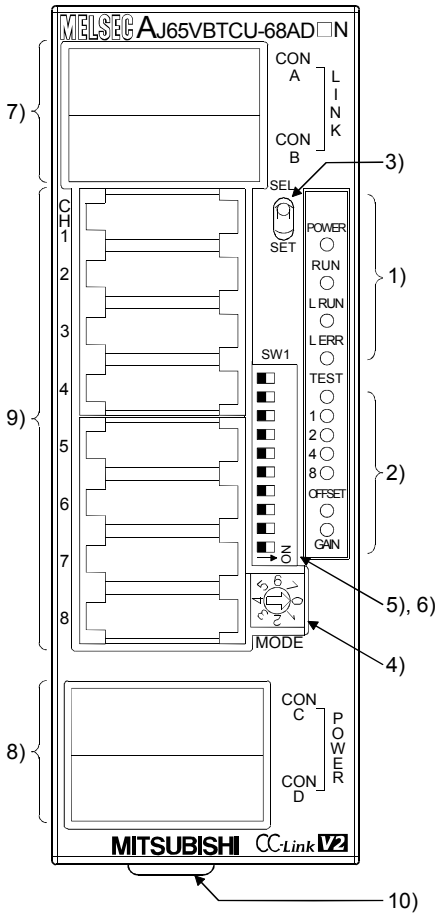
  (b) DIN rail installation screw interval
    When installing the DIN rail, tighten the screws with less than 200mm (7.87 inch) pitches.

(2) As the CC-Link connector type metal installation fitting, use the narrow-width type (width 41)-dedicated fitting.
  (a) CC-Link connector type metal installation fitting model
    A6PLT-J65V1

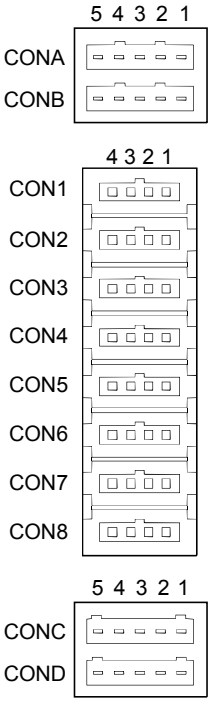
(3) Refer to the Master Module user's manual for specification, and manufacturers of supported cables for the use with AJ65VBTCU-68ADVN/ADIN.

4.3 Name of Each Part

The name of each part in the AJ65VBTCU-68ADVN/ADIN is shown.



[Pin layout and signals name]



A module view from the top

Pin arrangement	Pin No.		Signal name
	CONA, B	1	DA
		2	DB
		3	DG
		4	NC
		5	SLD
	CON1	1	CH1 V+/I+
		2	CH1 V-/I-
		3	NC
		4	SLD
	CON2	1	CH2 V+/I+
		2	CH2 V-/I-
		3	NC
		4	SLD
	CON3	1	CH3 V+/I+
		2	CH3 V-/I-
		3	NC
		4	SLD
	CON4	1	CH4 V+/I+
		2	CH4 V-/I-
		3	NC
		4	SLD
	CON5	1	CH5 V+/I+
		2	CH5 V-/I-
		3	NC
		4	SLD
	CON6	1	CH6 V+/I+
		2	CH6 V-/I-
		3	NC
		4	SLD
	CON7	1	CH7 V+/I+
		2	CH7 V-/I-
		3	NC
		4	SLD
	CON8	1	CH8 V+/I+
		2	CH8 V-/I-
		3	NC
		4	SLD
	CONC, D	1	FG
		2	+24V(UNIT)
		3	24G (UNIT)
		4	AG
		5	FG1

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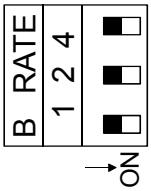
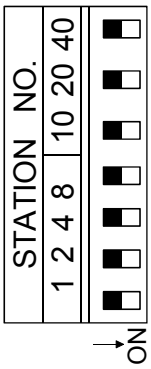
<table>
<tr><th>Number</th><th>Name and appearance</th><th colspan="3">Description</th></tr>
<tr><td rowspan="5">1)</td><td rowspan="5">Operation status display LED</td><td>POWER</td><td colspan="2">ON : Power supply on
OFF : Power supply off</td></tr>
<tr><td rowspan="2">RUN</td><td>Normal mode</td><td>On : Normal operation
Flashing: 0.1s intervals : Input range setting error, mode select switch setting error. This module is used as the Ver.2 remote device station (Ver.2 compatible slave station) when the network parameter mode is set to remote network Ver.1 mode.
0.5s intervals : Average value setting (count) time error. Mode select switch setting is changed after power-on.
Off : 24VDC power supply shutoff or watchdog timer error occurred</td></tr>
<tr><td>Test mode</td><td>On : Indicates that the SELECT/SET switch is in the SET position.
Flashing : 0.1s intervals : Mode select switch setting error
0.5s intervals : An attempt was made to make setting outside the setting range at the time of offset/gain setting.
Off : Indicates that the SELECT/SET switch is in the SELECT or center position.</td></tr>
<tr><td>L RUN</td><td colspan="2">On : Normal communication
Off : Communication cutoff (time expiration error)</td></tr>
<tr><td>L ERR.</td><td colspan="2">On : Indicates that transmission speed setting or station number setting is outside the range.
Flicker at fixed intervals : Indicates that transmission speed setting or station number setting was changed from that at power-on.
Flicker at unfixed intervals : Indicates that you forgot fitting the terminating resistor or the module or CC-Link dedicated cable is affected by noise.
Off : Indicates normal communications.</td></tr>
<tr><td rowspan="2">2)</td><td rowspan="2">Offset/gain adjusting LEDs</td><td rowspan="2">TEST
CH□
OFFSET
GAIN</td><td>Normal mode</td><td>Normally OFF</td></tr>
<tr><td>Test mode</td><td>TEST:ON
The OFFSET/GAIN/ CH□ LEDs lit change every time the SELECT/SET switch is moved to SELECT. (Refer to section 4.5)</td></tr>
<tr><td>3)</td><td>SELECT/SET switch</td><td colspan="3">Used to make offset/gain setting in the test mode.</td></tr>
<tr><td>4)</td><td>Mode select switch (Factory-set to "0")</td><td colspan="3">The switch to be used for selecting the mode among Ver.□ remote device station (Ver.□ -compatible slave station)/Normal mode/Test mode
<table>
<tr><th colspan="2">AJ65VBTCU-68ADVN</th><th colspan="2">AJ65VBTCU-68ADIN</th></tr>
<tr><td>Ver.1 remote device station (Ver.1-compatible slave station)</td><td>0: Normal mode
1: Test mode (User range setting 1)
2: Test mode (User range setting 2)</td><td>Ver.1 remote device station (Ver.1-compatible slave station)</td><td>0: Normal mode
1: Test mode (User range setting)</td></tr>
<tr><td>Ver.2 remote device station (Ver.2-compatible slave station)</td><td>3: Normal mode
4: Test mode (User range setting 1)
5: Test mode (User range setting 2)</td><td>Ver.2 remote device station (Ver.2-compatible slave station)</td><td>3: Normal mode
4: Test mode (User range setting)</td></tr>
<tr><td>-</td><td>6 to 7: Use prohibited</td><td>-</td><td>2, 5 to 7: Use prohibited</td></tr>
</table></td></tr>
</table>

<table>
<tr><th>Number</th><th>Name and appearance</th><th>Description</th></tr>
<tr><td>5)</td><td>Transmission speed setting switches
 
</td><td>
<table>
<tr><th rowspan="2">Set Value</th><th colspan="3">Setting Switches</th><th rowspan="2">Transmission Speed</th></tr>
<tr><th>4</th><th>2</th><th>1</th></tr>
<tr><td>0</td><td>OFF</td><td>OFF</td><td>OFF</td><td>156kbps</td></tr>
<tr><td>1</td><td>OFF</td><td>OFF</td><td>ON</td><td>625kbps</td></tr>
<tr><td>2</td><td>OFF</td><td>ON</td><td>OFF</td><td>2.5Mbps</td></tr>
<tr><td>3</td><td>OFF</td><td>ON</td><td>ON</td><td>5.0Mbps</td></tr>
<tr><td>4</td><td>ON</td><td>OFF</td><td>OFF</td><td>10Mbps</td></tr>
</table>
Always set the transmission speed within the above range.
The switches are all factory-set to OFF.
Making any other setting than the above will result in an error flickering the "L ERR." LED.
Confirm the transmission speed setting switch numbers on the seal located on the side face of the connector for analog I/O.</td></tr>
<tr><td>6)</td><td>Station number setting switches
 
</td><td>Use the switches in STATION NO. "10", "20" and "40" to set the tens of the station number.
Use the switches in STATION NO. "1", "2", "4" and "8" to set the units of the station number.
The switches are all factory-set to OFF.
Always set the station number within the range 1 to 64.
Setting any other number than 1 to 64 will result in an error, flickering the "L ERR." LED.
You cannot set the same station number to two or more stations.
<table>
<tr><th rowspan="2">Station Number</th><th colspan="3">Tens</th><th colspan="4">Units</th></tr>
<tr><th>40</th><th>20</th><th>10</th><th>8</th><th>4</th><th>2</th><th>1</th></tr>
<tr><td>1</td><td>OFF</td><td>OFF</td><td>OFF</td><td>OFF</td><td>OFF</td><td>OFF</td><td>ON</td></tr>
<tr><td>2</td><td>OFF</td><td>OFF</td><td>OFF</td><td>OFF</td><td>OFF</td><td>ON</td><td>OFF</td></tr>
<tr><td>3</td><td>OFF</td><td>OFF</td><td>OFF</td><td>OFF</td><td>OFF</td><td>ON</td><td>ON</td></tr>
<tr><td>4</td><td>OFF</td><td>OFF</td><td>OFF</td><td>OFF</td><td>ON</td><td>OFF</td><td>OFF</td></tr>
<tr><td>:</td><td>:</td><td>:</td><td>:</td><td>:</td><td>:</td><td>:</td><td>:</td></tr>
<tr><td>10</td><td>OFF</td><td>OFF</td><td>ON</td><td>OFF</td><td>OFF</td><td>OFF</td><td>OFF</td></tr>
<tr><td>11</td><td>OFF</td><td>OFF</td><td>ON</td><td>OFF</td><td>OFF</td><td>OFF</td><td>ON</td></tr>
<tr><td>:</td><td>:</td><td>:</td><td>:</td><td>:</td><td>:</td><td>:</td><td>:</td></tr>
<tr><td>64</td><td>ON</td><td>ON</td><td>OFF</td><td>OFF</td><td>ON</td><td>OFF</td><td>OFF</td></tr>
</table>
(Example) To set the station number to "32", set the switches as indicated below.
<table>
<tr><th rowspan="2">Station Number</th><th colspan="3">Tens</th><th colspan="4">Units</th></tr>
<tr><th>40</th><th>20</th><th>10</th><th>8</th><th>4</th><th>2</th><th>1</th></tr>
<tr><td>32</td><td>OFF</td><td>ON</td><td>ON</td><td>OFF</td><td>OFF</td><td>ON</td><td>OFF</td></tr>
</table>
Confirm the station number setting switch numbers on the seal located on the side face of the connector for analog I/O.</td></tr>
<tr><td>7)</td><td>One-touch connector for communication</td><td>A one-touch connector for connection of the communication line
When carrying out wiring, connect two optional one-touch connector plugs for communication at top and bottom.</td></tr>
<tr><td>8)</td><td>One-touch connector for power supply and FG</td><td>A one-touch connector for connection of the module power supply line and FG.
When carrying out jumper wiring, connect two optional one-touch connector plugs for power supply and FG at top and bottom.</td></tr>
<tr><td>9)</td><td>One-touch connector for analog I/O</td><td>One-touch connector for analog I/O
Connect a one-touch connector plug when wiring.</td></tr>
<tr><td>10)</td><td>DIN rail hook</td><td>Used to mount the module to the DIN rail.</td></tr>
</table>

POINT

After power-on, do not change the mode select switch setting.
If you change it midway during operation, the setting at power-on is valid.

4.4 Concept of Mode Select Switch Setting (Selection of Remote Device Station Compatible Version)

The AJ65VBTCU-68ADVN/ADIN must be handled after setting of the remote device station version according to the configuration of the used CC-Link system.

There are the following remote device stations.

- Ver. 1 remote device station (Ver. 1 compatible slave station)
- Ver. 2 remote device station (Ver. 2 compatible slave station)

Set the remote device station version with the "mode select switch" of the AJ65VBTCU-68ADVN/ADIN. Refer to Section 4.3 for details of the mode select switch. In addition, "mode setting" and "station information (station type)" in the network parameters of GX Developer must be set simultaneously. For details, refer to (2) in this section and Chapter 5 Programming.

(1) Basic concept

Use the following as a guideline in setting the remote device station version and mode select switch.

Mode Select Switch Setting	Guideline for Selection
Ver. 1 remote device station (Ver. 1 compatible slave station) Number of occupied stations: 3 stations	In the case of the system where the maximum number of connected stations of the master station, including the AJ65VBTCU-68ADVN/ADIN that occupies 3 stations, does not exceed 64 stations.
Ver. 2 remote device station (Ver. 2 compatible slave station) Number of occupied stations: 1 station	In the case of the system where the maximum number of connected stations of the master station, including the AJ65VBTCU-68ADVN/ADIN that occupies 3 stations, exceeds 64 stations. (However, configure a system where the maximum number of connected stations of the master station, including the AJ65VBTCU-68ADVN/ADIN that occupies 1 station, will not exceed 64 stations.)

POINT

In the case of the system where the maximum number of connected stations of the master station, including the AJ65VBTCU-68ADVN/ADIN that occupies 3 stations, does not exceed 64 stations, set and use the ver. 1 remote device station (ver. 1 compatible slave station). It is not particularly necessary to set and use the ver. 2 remote device station (ver. 2 compatible slave station).

(2) Applicable combinations and setting concepts

The following table indicates usability according to the combinations of the master modules, the mode setting and station information (station type) of the GX Developer network parameters, and the mode select switch setting of the module. Refer to the following table and make selection.

○: Usable, ×: Unusable

Master Module	Network Parameter Setting		Model Select Switch Setting of AJ65VBTCU-68ADVN/ADIN	
	Mode setting	Station information (station type)	Ver. 1 remote device station (Ver. 1 compatible slave station)	Ver. 2 remote device station (Ver. 2 compatible slave station)
QJ61BT11 AJ61BT11 A1SJ61BT11 AJ61QBT11 A1SJ61QBT11	Remote net ver. 1 mode	Remote device station	○ Concept A	×
	Remote net ver. 2 mode	Ver. 1 remote device station	×	×
		Ver. 2 remote device station		
	Remote net additional mode	Ver. 1 remote device station		
		Ver. 2 remote device station		
QJ61BT11N	Remote net ver. 1 mode	Remote device station	○ Concept B	×
	Remote net ver. 2 mode	Ver. 1 remote device station	○ Concept C	×
		Ver. 2 remote device station	×	○ Concept D
	Remote net additional mode	Ver. 1 remote device station	○ Concept E	×
		Ver. 2 remote device station	×	○ Concept F

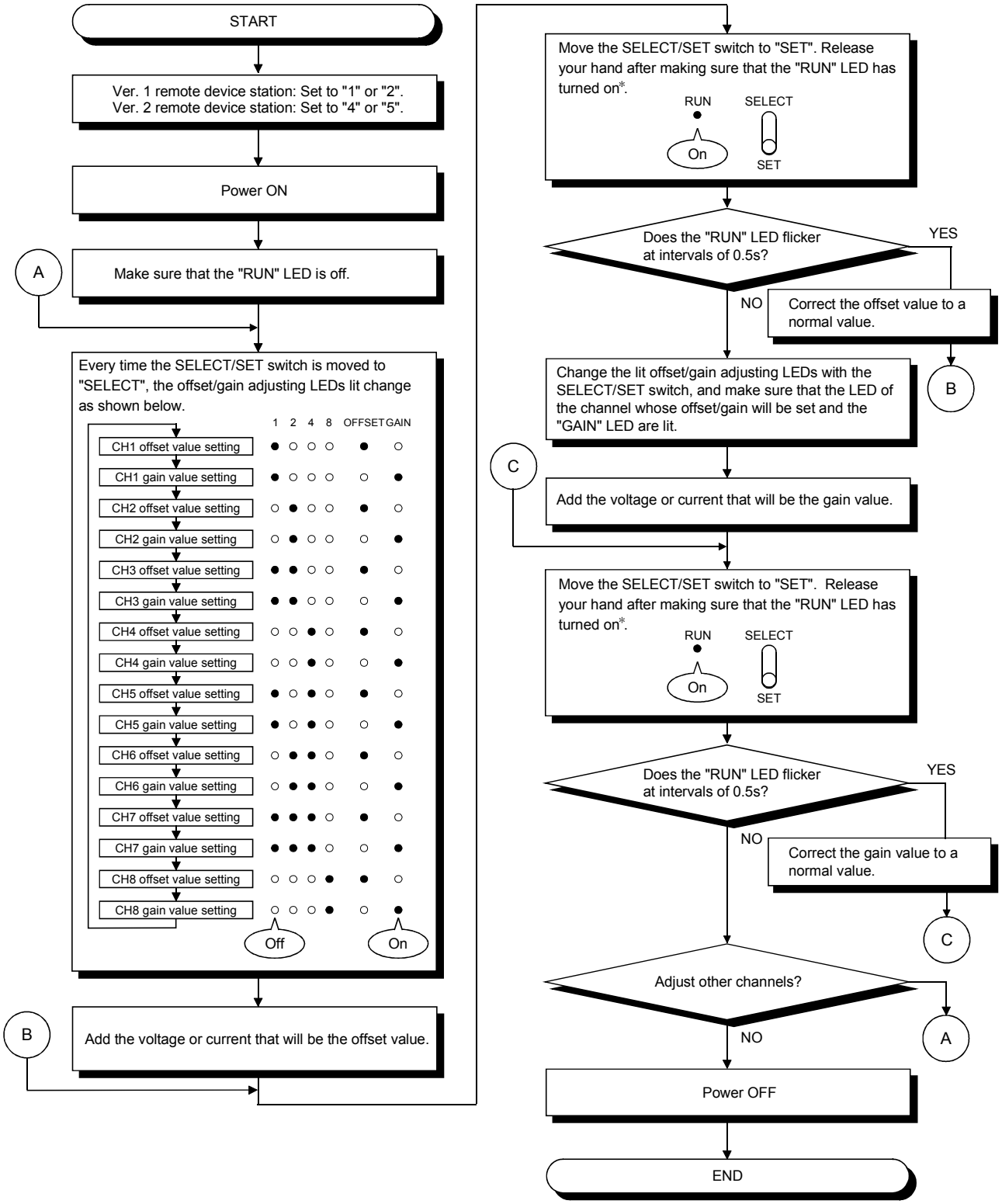
Setting Concept	Outline
Concept A	Select this concept when system expansion is not necessary. Select this concept when the module replaces the conventional one as a maintenance product.
Concept B	Select this concept when system expansion is not necessary. Select this concept when the module replaces the conventional one as a maintenance product.
Concept C	Select this concept when configuring a new system. The ver. 1 compatible slave station and ver. 2 compatible slave station can be mixed. The ver. 1 remote device station occupies 3 stations.
Concept D	Select this concept when configuring a new system. The ver. 1 compatible slave station and ver. 2 compatible slave station can be mixed. The ver. 2 remote device station occupies 1 station, and can connect more devices. Refer to Chapter 5 Programming.
Concept E	This concept allows this module to be newly added to the existing system. When there is a station number used as the ver. 2 remote device station in the existing system, set the station number of the ver. 1 remote device station to be added before that station. The ver. 1 remote device station occupies 3 stations.
Concept F	This concept allows this module to be newly added to the existing system. Set the station number of the ver. 2 remote device station to be added after the station numbers used in the existing system. The ver. 2 remote device station occupies 1 station, and can connect more devices. Refer to Chapter 5 Programming.

POINT

For use in the remote net ver. 2 mode or remote net additional mode, the master module of QJ61BT11N and the peripheral software package of GX Developer Version 8.03D or later are required.
For more information on the applicable modules (CPU modules, network modules) and applicable software packages, refer to the CC-Link System Master/Local Module User's Manual (Details) QJ61BT11N.

4.5 Offset/Gain Setting

When changing the I/O conversion characteristics, follow the procedure below.


START
Ver. 1 remote device station: Set to "1" or "2".
Ver. 2 remote device station: Set to "4" or "5".
Power ON
A
Make sure that the "RUN" LED is off.
Every time the SELECT/SET switch is moved to "SELECT", the offset/gain adjusting LEDs lit change as shown below.
1 2 4 8 OFFSET GAIN
CH1 offset value setting
CH1 gain value setting
CH2 offset value setting
CH2 gain value setting
CH3 offset value setting
CH3 gain value setting
CH4 offset value setting
CH4 gain value setting
CH5 offset value setting
CH5 gain value setting
CH6 offset value setting
CH6 gain value setting
CH7 offset value setting
CH7 gain value setting
CH8 offset value setting
CH8 gain value setting
Off
On
B
Add the voltage or current that will be the offset value.
Move the SELECT/SET switch to "SET". Release your hand after making sure that the "RUN" LED has turned on*.
RUN
SELECT
On
SET
Does the "RUN" LED flicker at intervals of 0.5s?
YES
NO
Correct the offset value to a normal value.
B
Change the lit offset/gain adjusting LEDs with the SELECT/SET switch, and make sure that the LED of the channel whose offset/gain will be set and the "GAIN" LED are lit.
C
Add the voltage or current that will be the gain value.
Move the SELECT/SET switch to "SET". Release your hand after making sure that the "RUN" LED has turned on*.
RUN
SELECT
On
SET
Does the "RUN" LED flicker at intervals of 0.5s?
YES
NO
Correct the gain value to a normal value.
C
Adjust other channels?
NO
A
Power OFF
END

* If the "RUN" LED is not lit, E^2PROM may have failed. For details, refer to Section 3.5.2.

POINT

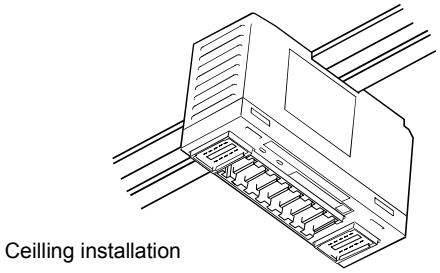
(1) Set the offset and gain values in the actual usage state.
(2) The offset and gain values are stored on E^2PROM in the AJ65VBTCU-68ADVN/ADIN and are not cleared at power-off.
(3) Make offset/gain setting within the range indicated in POINT of Section 3.3.1 and Section 3.3.2. If setting is made outside this range, the maximum resolution/accuracy may not fall within the performance specifications range.
(4) When making offset/gain setting (in the test mode), set any of the following test modes with the mode select switch.
AJ65VBTCU-68ADVN (Ver. 1 remote device station): 1, 2
AJ65VBTCU-68ADVN (Ver. 2 remote device station): 4, 5
AJ65VBTCU-68ADIN (Ver. 1 remote device station): 1
AJ65VBTCU-68ADIN (Ver. 2 remote device station): 4
The user range settings 1 selected with the mode select switch set to 1 and 4 are the same. The setting of the user range setting 1 can be changed by setting the mode select switch to either 1 or 4. This also applies to the user range settings 2 selected with the mode select switch set to 2 and 5.
If the switch has been set to any unusable number, an error occurs and the "RUN" LED flickers at intervals of 0.1s.
(5) When the grounding indicated in Section 4.8.2 *5 is changed (not performed → perform, or performed to removed), repeat the offset/gain setting from the start.

4.6 Station Number Setting

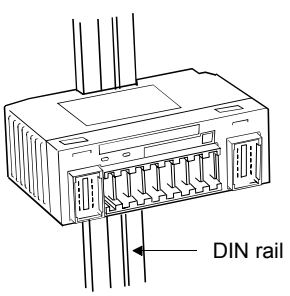
The station number setting of the AJ65VBTCU-68ADVN/ADIN determines the buffer memory addresses of the master module where the remote I/O signals and read/write data are stored.
For details, refer to the user's manual of the master module used.

4.7 Facing Direction of the Module Installation

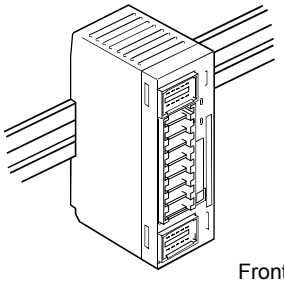
The AJ65VBTCU-68ADVN/ADIN module may be installed in any of six orientations using a DIN rail or CC-Link connector type fitting.
(There are no restrictions on the facing directions.)

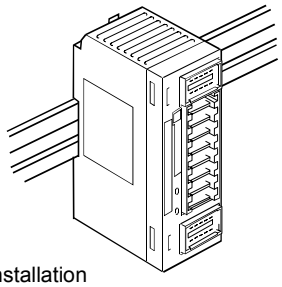


Ceilling installation

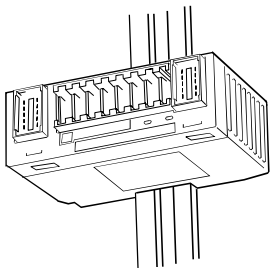


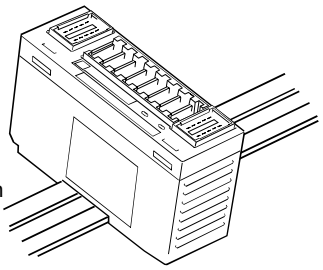
DIN rail





Front installation





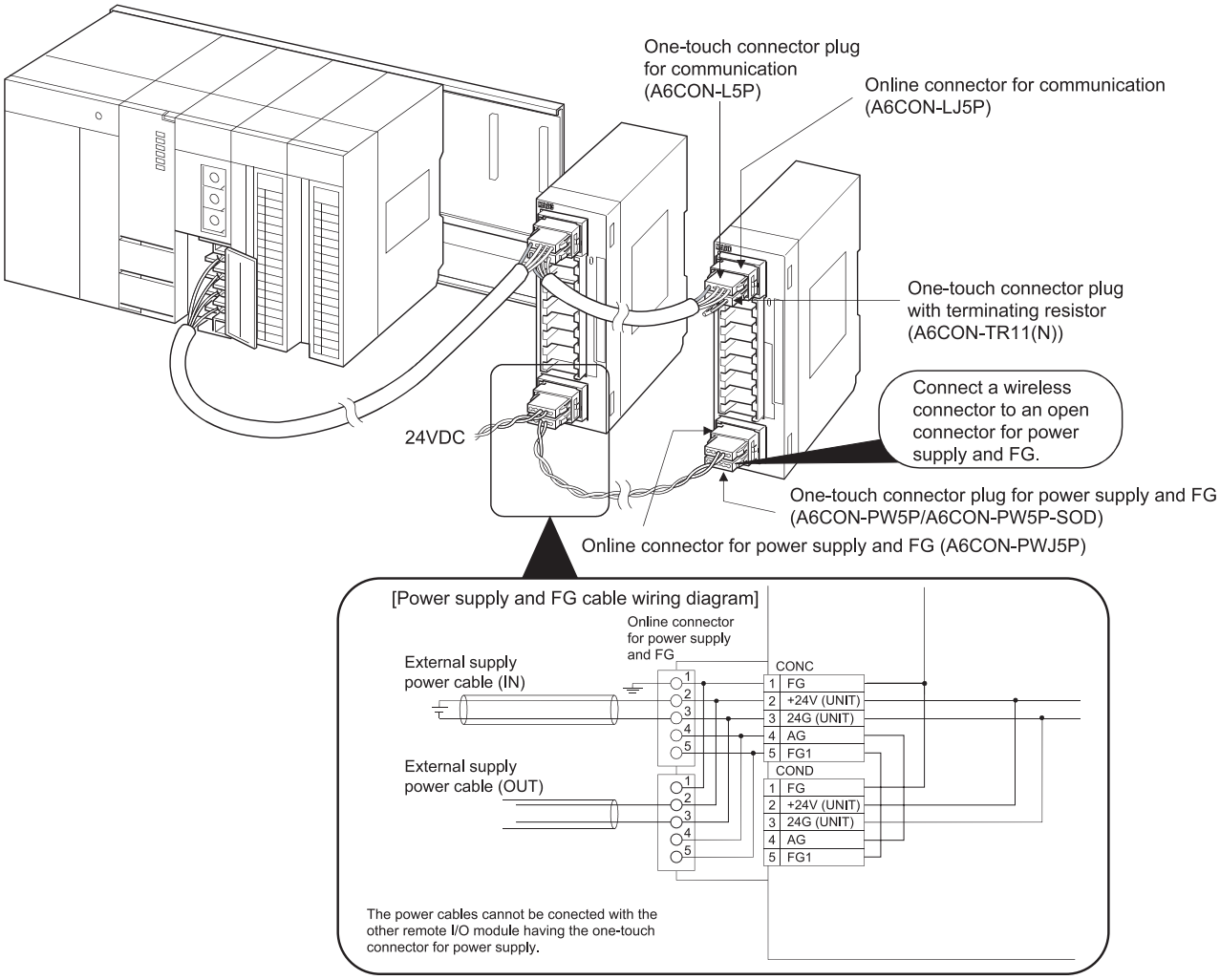
Flat installation

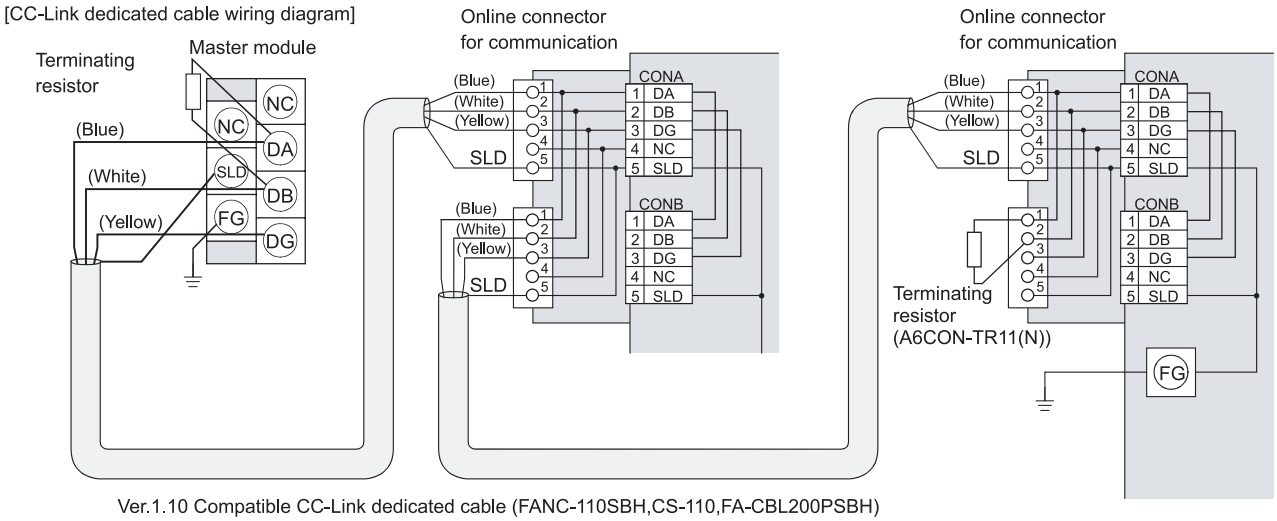
4.8 Data Link Cable Wiring

This section explains the wiring of the CC-Link dedicated cable used for connection of the AJ65VBTCU-68ADVN/ADIN and master module.

4.8.1 Connection of the CC-Link dedicated cables

Connect the CC-Link dedicated cable between the AJ65VBTCU-68ADVN/ADIN and master module as shown below.


One-touch connector plug for communication (A6CON-L5P)
Online connector for communication (A6CON-LJ5P)
One-touch connector plug with terminating resistor (A6CON-TR11(N))
Connect a wireless connector to an open connector for power supply and FG.
24VDC
One-touch connector plug for power supply and FG (A6CON-PW5P/A6CON-PW5P-SOD)
Online connector for power supply and FG (A6CON-PWJ5P)
[Power supply and FG cable wiring diagram]
Online connector for power supply and FG
External supply power cable (IN)
External supply power cable (OUT)
CONC
1 FG
2 +24V (UNIT)
3 24G (UNIT)
4 AG
5 FG1
COND
1 FG
2 +24V (UNIT)
3 24G (UNIT)
4 AG
5 FG1
The power cables cannot be conected with the other remote I/O module having the one-touch connector for power supply.



Ver.1.10 Compatible CC-Link dedicated cable (FANC-110SBH,CS-110,FA-CBL200PSBH)

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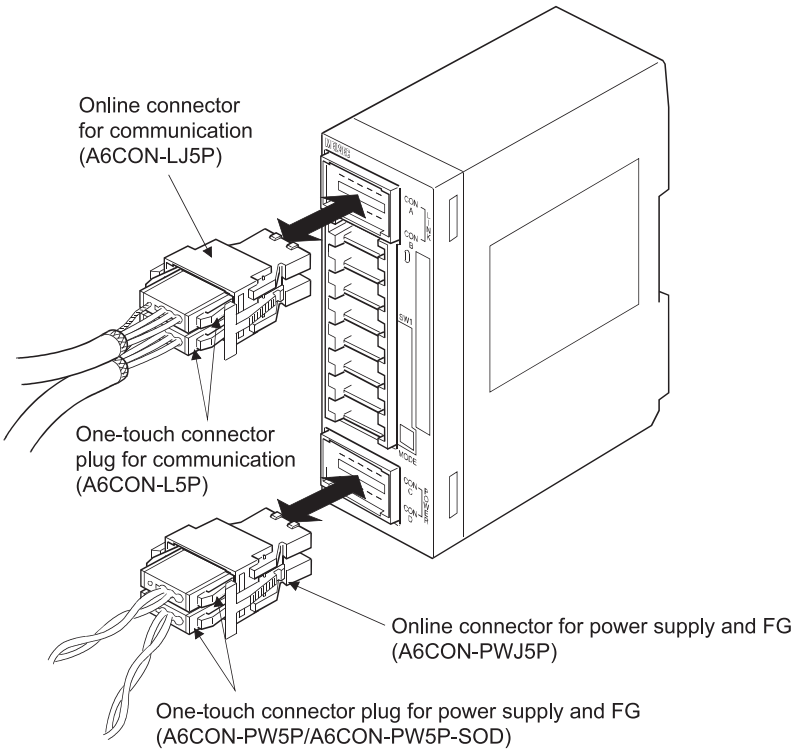
POINT

- On this unit, use the Ver. 1.10-compatible CC-Link dedicated cable (FANC-110SBH, CS-110, FA-CBL200PSBH).
  You cannot use the Ver. 1.10-compatible CC-Link dedicated cables of other than the above types, CC-Link dedicated cables and CC-Link dedicated, high-performance cables.
- The shield cable of the CC-Link dedicated cable should be connected to "SLD" in each module, and both ends should be grounded through "FG".
  SLD and FG are connected inside the module.

4.8.2 How to connect connectors

The following shows how to connect the one-touch connectors and online connectors.



POINT

To connect or remove a one-touch connector to/from an online connector, refer to the manual included with the online connector.

4.9 Wiring

This section provides the instructions for wiring the AJ65VBTCU-68ADVN/ADIN and its wiring with external equipment.

4.9.1 Wiring precautions

To obtain maximum performance from the functions of AJ65VBTCU-68ADVN/ADIN and improve the system reliability, an external wiring with high durability against noise is required.
The precautions when performing external wiring are as follows:

(1) Use separate cables for the AC and AJ65VBTCU-68ADVN/ADIN external input signals, in order not to be affected by the AC side surge or conductivity.

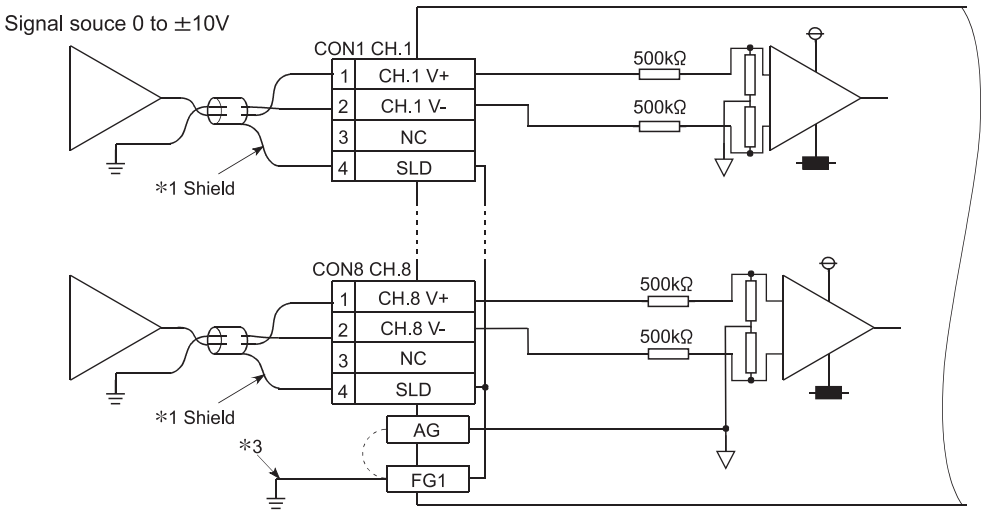
(2) Do not bundle or place with load carrying wires other than the main circuit line, high voltage line or programmable controller. Noises, surges, or conductivity may affect the system.

(3) Place a one-point grounding on the programmable controller side for the shielded line or shielded cable. However, depending on the external noise conditions, it may be better have a grounding externally.

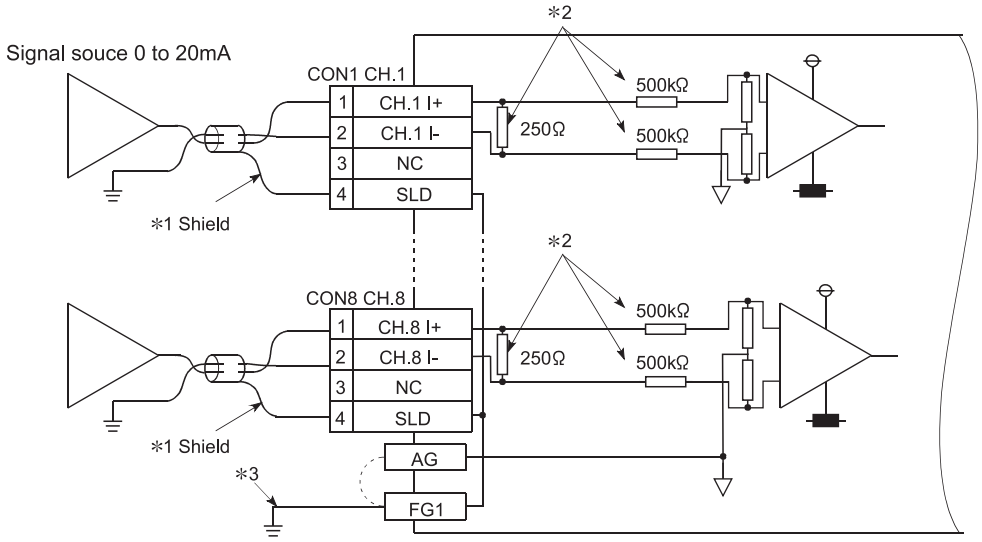
(4) Smoke and fire may occur when an overcurrent flows intermittently for a long period of time. To avoid this, configure a safety circuit, such as an external fuse, to protect the product.

4.9.2 Wiring of module with external equipment

(1) AJ65VBTCU-68ADVN



(2) AJ65VBTCU-68ADIN



*1 Use a two-core twisted shield line for the power cable.

*2 Indicates the AJ65VBTCU-68ADIN input resistor.

*3 Always perform grounding for FG1. When there is a lot of noise, it may be better ground AG as well.
If the grounding wiring (grounding yes/no) is changed after the offset and gain are set, perform the setting of the offset/gain values again.

POINT

- A/D conversion needs to be powered on 30 mintes prior to operation for compliance to the specification (sccuracy).
- Do not insert the one-touch connector plug for I/O of the one-touch connector type/connector type compact remote I/O unit into the one-touch connector for analog I/O accidentally.
  Doing so can cause the module to be damaged.
- In an unused channel, if terminals remain open, an erratic digital value may be output.
  To prevent this, take any of the following measures.
  1. Select Prohibit in the A/D conversion enable/prohibit setting for the unused channel.
     Note that changing the setting from Enable to Prohibit will reduce the sampling cycle.
  2. Short-circuit the input terminals (terminal V+ and V-) of the unused channel.
  3. Connect the AG terminal to the GND terminal of the external device.

4.10 How to Wire the One-Touch Connector Plug

This section describes the way to wire the one-touch connector plug.
Refer to section 2.3 for more information on the types and specifications of the one-touch connector plugs which conform to the AJ65VBTCU-68ADVN/ADIN.

4.10.1 Precautions for the transition wiring of the one-touch connector for power supply and FG

When the power supply is connected in the transition wiring with the one-touch connector for power supply and FG, a current flows in the inside of the module. At the transition wiring, the maximum rated current must be lower than the following values. Smoke and fire may occur when an overcurrent at the rated value or higher flows intermittently for a long period of time. To avoid this, configure a safety circuit, such as an external fuse, to protect the product.
Depending on the operation characteristics of the fuse etc., a current which exceeds considerably the rating may flow. Therefore, in order to avoid the damage on the module, make a selection with enough safety allowance, considering the following maximum rated current.

No.	Power supply port name	Power supply port	Maximum rated current
1)	Module power supply (IN)	One-touch connector for power supply and FG (CONC-2, 3 pin)	7A*1

No.	Power supplied by the power supply port	Description of the power supplies	Maximum consumption current
1)	Module power supply (IN)	Power supply for operating the CC-Link module	Refer to the external power supply consumption current values in the module specifications.
2)	Module power supply (OUT)	Power which supplies the module and external devices connected in the module transition wiring	According to the connected module and external device.

*1 Configure 1) so that 2) + 3) is lower than the maximum rated current (7A).

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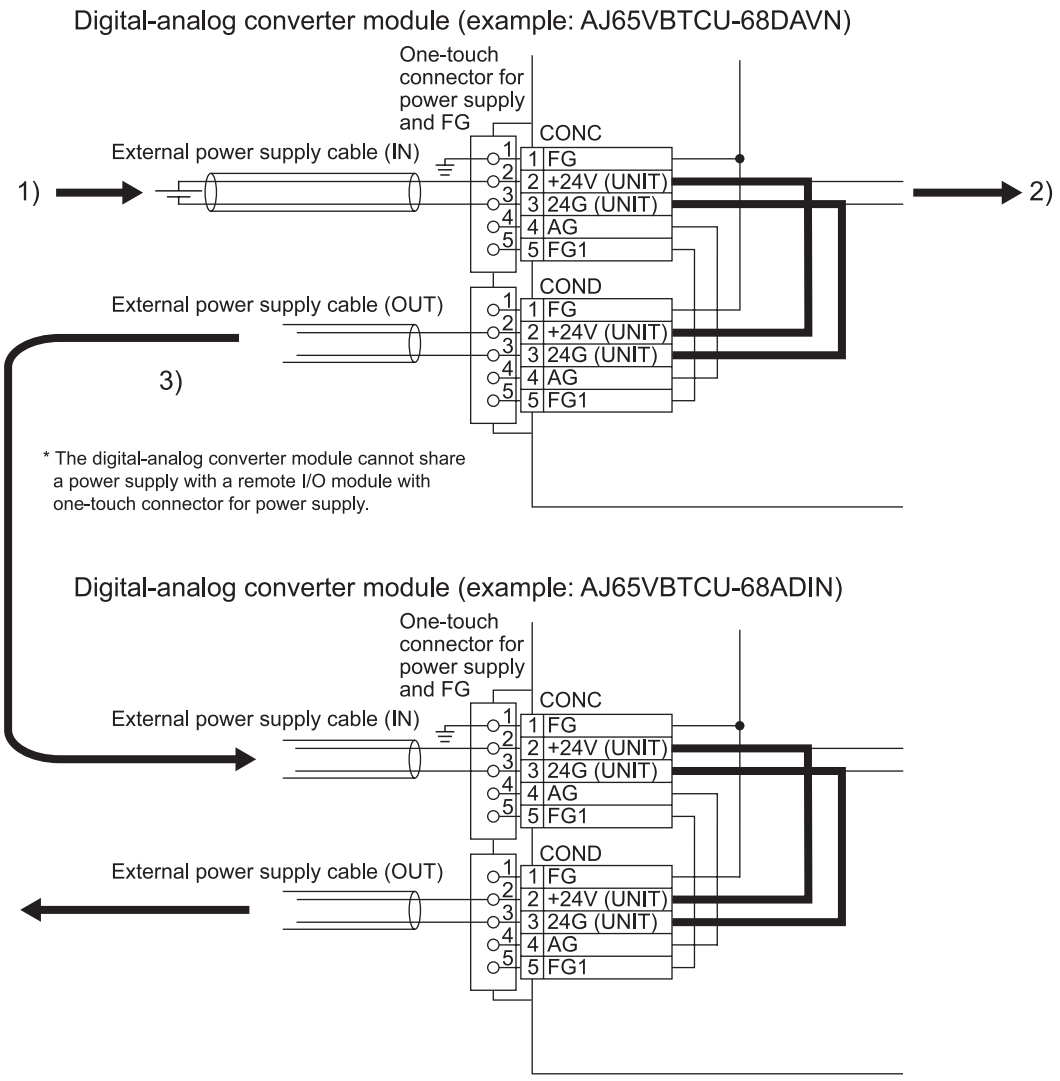
System example


Digital-analog converter module (example: AJ65VBTCU-68DAVN)
One-touch connector for power supply and FG
CONC
External power supply cable (IN)
1) 2)
1 FG
2 +24V (UNIT)
3 24G (UNIT)
4 AG
5 FG1
COND
External power supply cable (OUT)
3)
* The digital-analog converter module cannot share a power supply with a remote I/O module with one-touch connector for power supply.
Digital-analog converter module (example: AJ65VBTCU-68ADIN)
One-touch connector for power supply and FG
CONC
External power supply cable (IN)
COND
External power supply cable (OUT)

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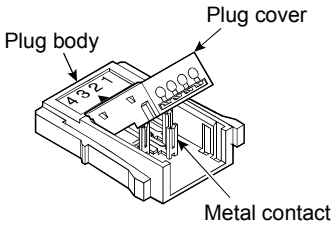
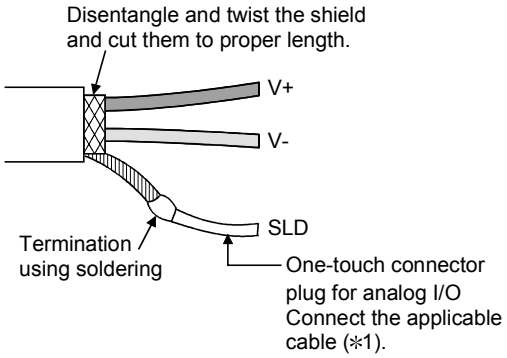
4.10.2 Wiring procedures for the one-touch connector

The following are the wiring procedures for the one-touch connector.

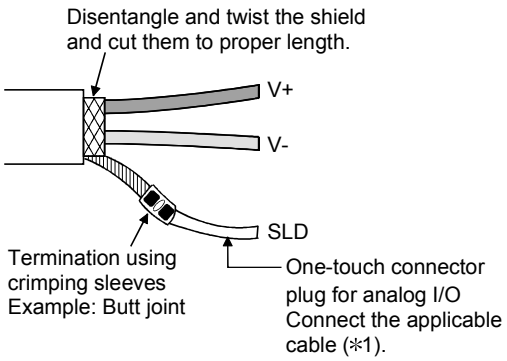


↓

[Termination using soldering]


Disentangle and twist the shield and cut them to proper length.
V+
V-
SLD
Termination using soldering
One-touch connector plug for analog I/O Connect the applicable cable (*1).

[Termination using crimping sleeves]


Disentangle and twist the shield and cut them to proper length.
V+
V-
SLD
Termination using crimping sleeves Example: Butt joint
One-touch connector plug for analog I/O Connect the applicable cable (*1).

*1 For the applicable cable size, refer to section 3.2.

↓

(To the next page)

1) Check the connector.
Check that the plug cover is attached to the plug body.

Note: Do not push the plug cover into the plug body.
Once pressed, the plug cannot be used any more.

2) Processing for analog input cable
Strip the cable 3cm or more and perform the processing indicated at left.
If the electric wire lengths are not even, trim their ends with a nipper to the same length so as to insert them neatly into a connector.

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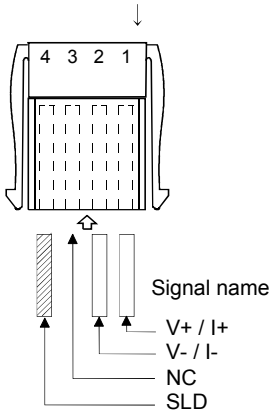
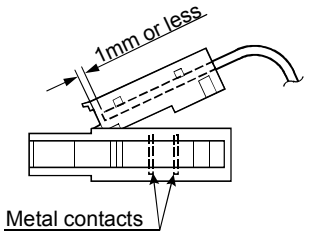
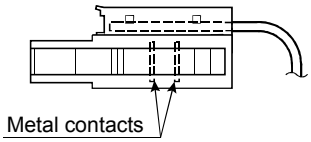
(From the previous page)



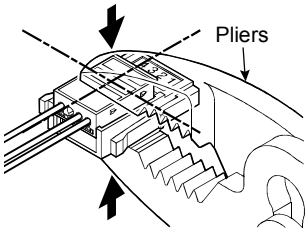
3) Insert the cable.
Lift the end of the plug cover and insert the cable until it almost reaches the plug body (within 1mm from the other end of the plug cover).
Insufficient cable insertion may cause improper press fitting.

Note: When inserting the cable, prevent the cable from sticking out from the plug cover end.



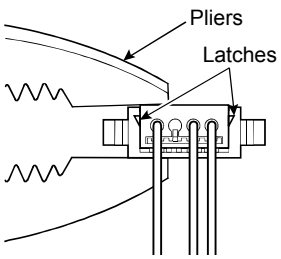


4) Set the plug cover.
After inserting the cable, put down the plug cover so that its face is horizontal to the plug surface, allowing the metal contacts to be fitted into the plug cover.



5) Press the center part of the plug cover.
Using pliers, press the center part of the plug cover vertically and strongly.

For the one-touch connectors, use adjustable pliers so that their jaws can be widely opened.



6) Press both ends of the plug cover
After pressing the center part of the plug cover, press both ends of the plug cover where latches are located.
Verify that the latches engage with the plug body.

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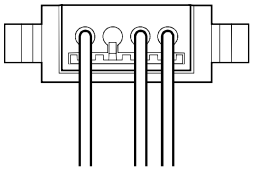
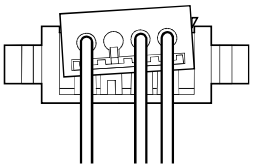
[Correct example]

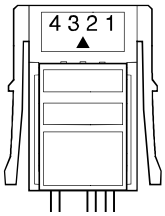


[Wrong example]

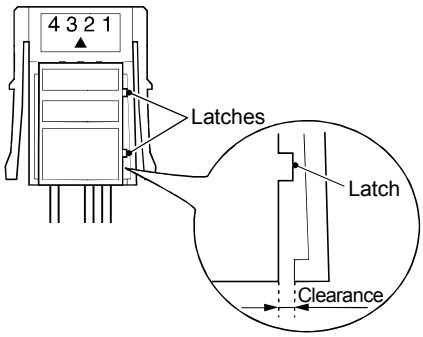


↓

[Correct example]



[Wrong example]



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(Wiring completed)

7) Check the press-fit condition (viewing from the wiring side).
Viewing from the wiring side, check that the plug surface is flush with the plug cover.
Do not allow the plug cover to protrude from the plug surface.

Note: The condition where the plug cover is tilted or protrudes from the plug surface as shown in [Wrong example] is an improper press-fit condition.
Press the plug cover firmly with pliers until it looks like [Correct example] condition illustrated on the left.

8) Check the press-fit condition (viewing from the top).
Viewing from the top, check that there is no clearance between the plug body and plug cover.

Note: Clearance may occur between the plug body and plug cover when the latches do not engage securely as shown in [Wrong example].
Press the plug cover firmly with pliers until it looks like [Correct example] condition illustrated on the left.

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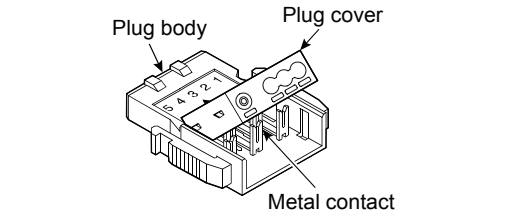
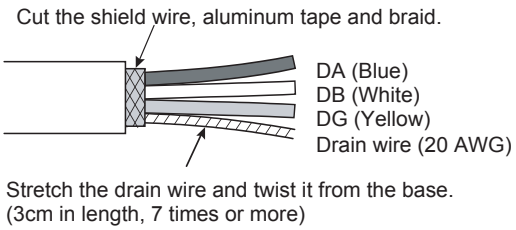
4.10.3 Wiring procedures for the one-touch connector for communication

This section provides the wiring procedures of the one-touch connector for communication.

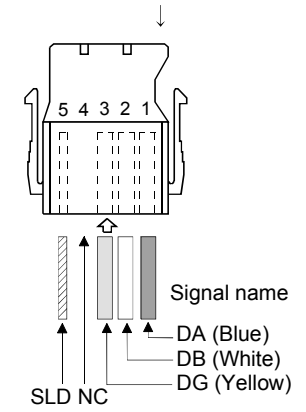


1) Check the connector.
Check that the plug cover is attached to the plug body.

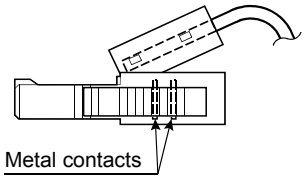
Note: Do not push the plug cover into the plug body.
Once pressed, the plug cannot be used any more.

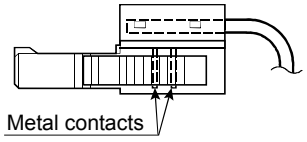

Cut the shield wire, aluminum tape and braid.
DA (Blue)
DB (White)
DG (Yellow)
Drain wire (20 AWG)
Stretch the drain wire and twist it from the base.
(3cm in length, 7 times or more)

2) Processing for communication cable
Strip the cable 3cm or more and perform the processing indicated at left.
If the electric wire lengths are not even, trim their ends with a nipper to the same length so as to insert them neatly into a connector.

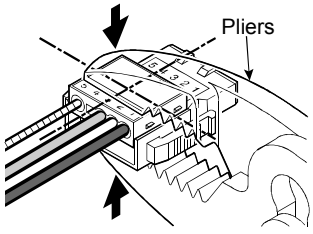


3) Insert the cable.
Lift the end of the plug cover and insert the cable until it almost reaches the plug body (within 1mm from the other end of the plug cover).
Insufficient cable insertion may cause improper press fitting.





4) Set the plug cover.
After inserting the cable, put down the plug cover so that its face is horizontal to the plug surface, allowing the metal contacts to be fitted into the plug cover.



5) Press the center part of the plug cover.
Using pliers, press the center part of the plug cover vertically and strongly.

For the one-touch connectors, use adjustable pliers so that their jaws can be widely opened.

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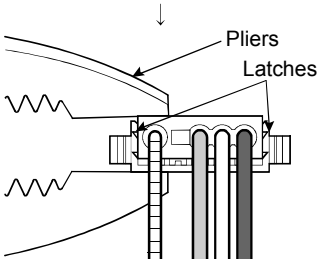
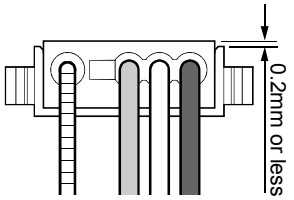


6) Press both ends of the plug cover
After pressing the center part of the plug cover, press both ends of the plug cover where latches are located.
Verify that the latches engage with the plug body.

↓

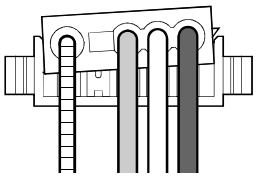
[Correct example]



7) Check the press-fit condition (viewing from the wiring side).
Viewing from the wiring side, check that the plug surface is flash with the plug cover.
The difference between the plug cover and the plug surface must be 0.2mm or less.

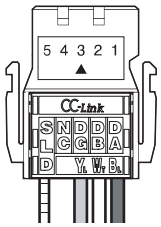
Note: The condition where the plug cover is tilted as shown in [Wrong example] or protrudes from the plug surface 0.2mm or more is an improper press-fit condition.
Press the plug cover securely with pliers until it looks like [Correct example] condition illustrated on the left.

[Wrong example]



↓

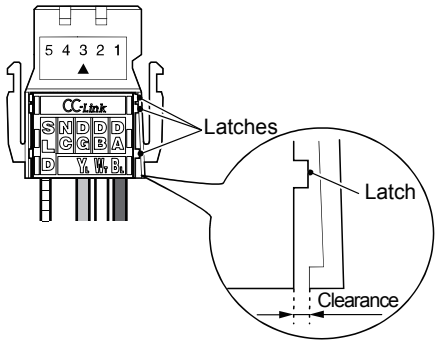
[Correct example]



8) Check the press-fit condition (viewing from the top).
Viewing from the top, check that there is no clearance between the plug body and plug cover.

Note: Clearance may occur between the plug body and plug cover when the latches do not engage securely as shown in [Wrong example].
Press the plug cover firmly with pliers until it looks like [Correct example] condition illustrated on the left.

[Wrong example]



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(Wiring completed)

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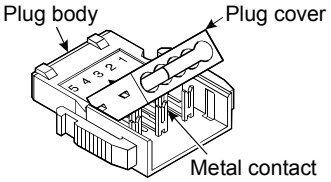
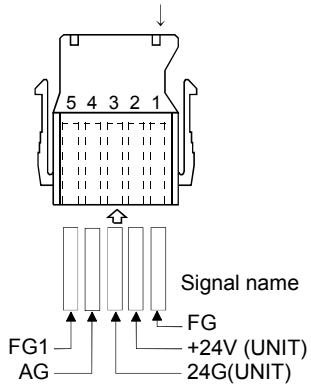
4.10.4 Wiring procedures for the one-touch connector for power supply and FG

The following are the wiring procedures for the one-touch connector used for power supply and FG.

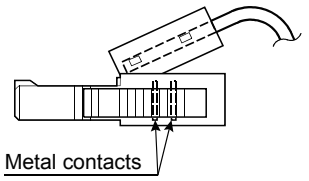


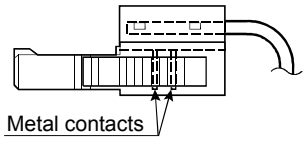
1) Check the connector.
Check that the plug cover is attached to the plug body.

Note: Do not push the plug cover into the plug body.
Once pressed, the plug cannot be used any more.

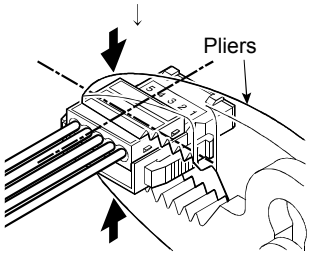


2) Insert the cable. (*1)
Lift the end of the plug cover and insert the cable until it almost reaches the plug body (within 1mm from the other end of the plug cover).
Insufficient cable insertion may cause improper press fitting.



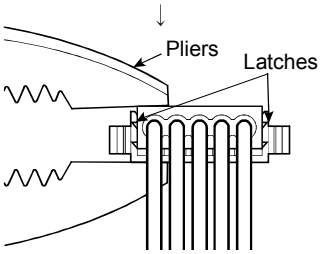


3) Set the plug cover.
After inserting the cable, put down the plug cover so that its face is horizontal to the plug surface, allowing the metal contacts to be fitted into the plug cover.



4) Press the center part of the plug cover.
Using pliers, press the center part of the plug cover vertically and strongly.

For the one-touch connector for power supply and FG, use adjustable pliers so that their jaws can be widely opened.



5) Press both ends of the plug cover
After pressing the center part of the plug cover, press both ends of the plug cover where latches are located.
Verify that the latches engage with the plug body.

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(From the previous page)

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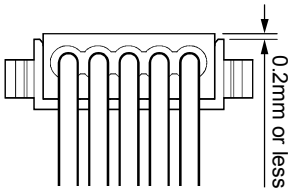
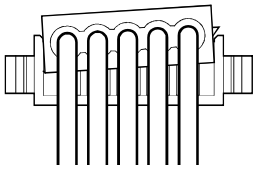
[Correct example]



[Wrong example]



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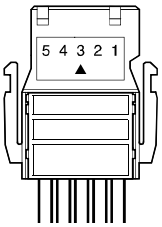
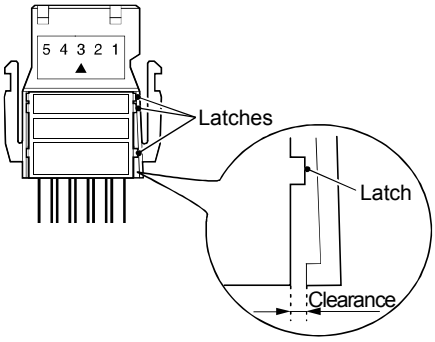
[Correct example]



[Wrong example]



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(Wiring completed)

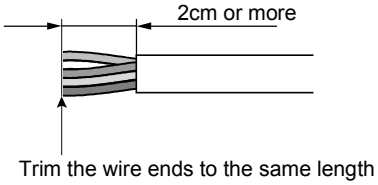
6) Check the press-fit condition (viewing from the wiring side).
Viewing from the wiring side, check that the plug surface is flush with the plug cover.
Set the plug cover so that it protrudes 0.2mm or less from the plug surface.

Note: The condition where the plug cover is tilted or protrudes 0.2mm or more from the plug surface as shown in [Wrong example] is an improper press-fit condition.
Press the plug cover firmly with pliers until it looks like [Correct example] condition illustrated on the left.

7) Check the press-fit condition (viewing from the top).
Viewing from the top, check that there is no clearance between the plug body and plug cover.

Note: Clearance may occur between the plug body and plug cover when the latches do not engage securely as shown in [Wrong example].
Press the plug cover firmly with pliers until it looks like [Correct example] condition illustrated on the left.

*1 When using a cabtyre cable:
Strip the cable 2cm or more.
If the electric wire lengths are not even, trim their ends with a nipper to the same length so as to insert them neatly into a connector.



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4.11 Maintenance and Inspection

There are no special inspection items for the AJ65VBTCU-68ADVN/ADIN module, but follow the inspections items describes in the programmable controller CPU User's Manual so that the system can always be used in the best condition.

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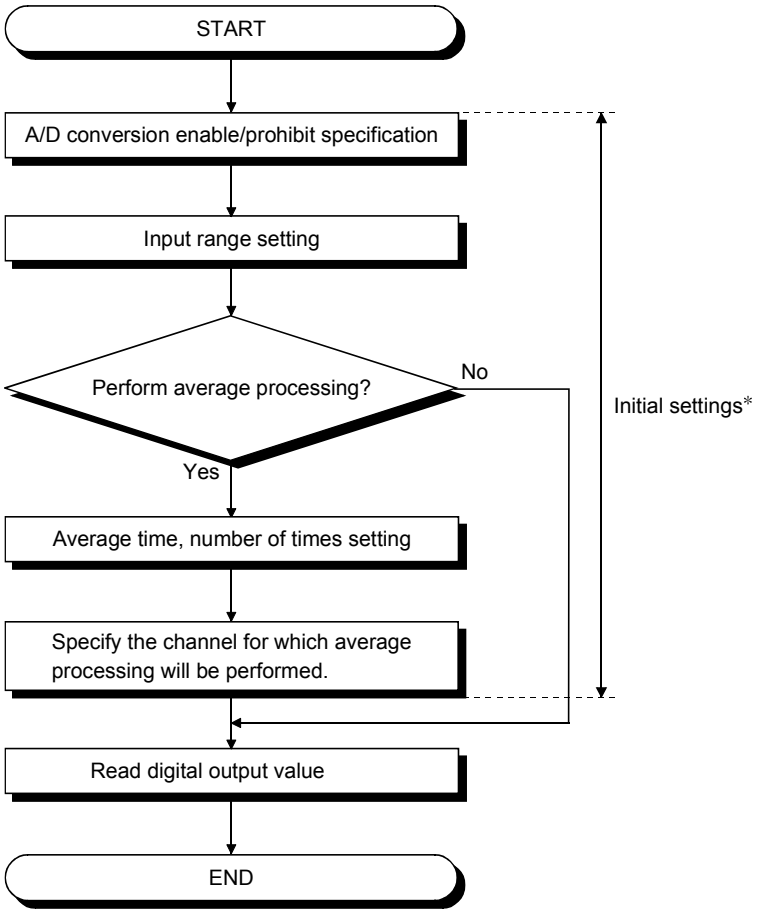
5 PROGRAMMING

The programming procedure, basic read/write programs, and program examples for the AJ65VBTCU-68ADVN/ADIN are described.
When utilizing the program example introduced in this chapter for an actual system, fully verify that there are no problems in controllability in the target system.
Refer to the user's manual of the master module used for the master module, to Section 3.6 for the remote registers, and to the AnSHCPU/AnACPU/AnUCPU/QCPU-A (A mode) Programming Manual (Dedicated Instructions) for details of the dedicated instructions.

5.1 Programming Procedure

Create a program which executes the AJ65VBTCU-68ADVN/ADIN analog/digital conversion by following the procedure below:



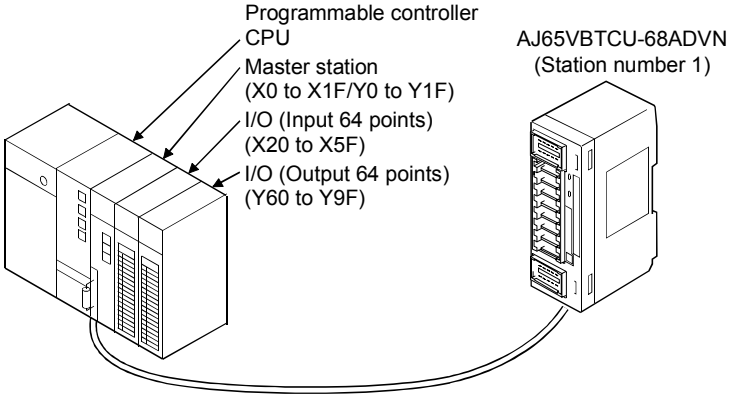
* When using the QCPU (Q mode), you can use the remote device station initialization procedure registration function to make settings. When using the ACPU, QCPU (A mode) or QnACPU, use the sequence program to make settings.

5.2 When Remote Net Ver. 1 Mode Is Used

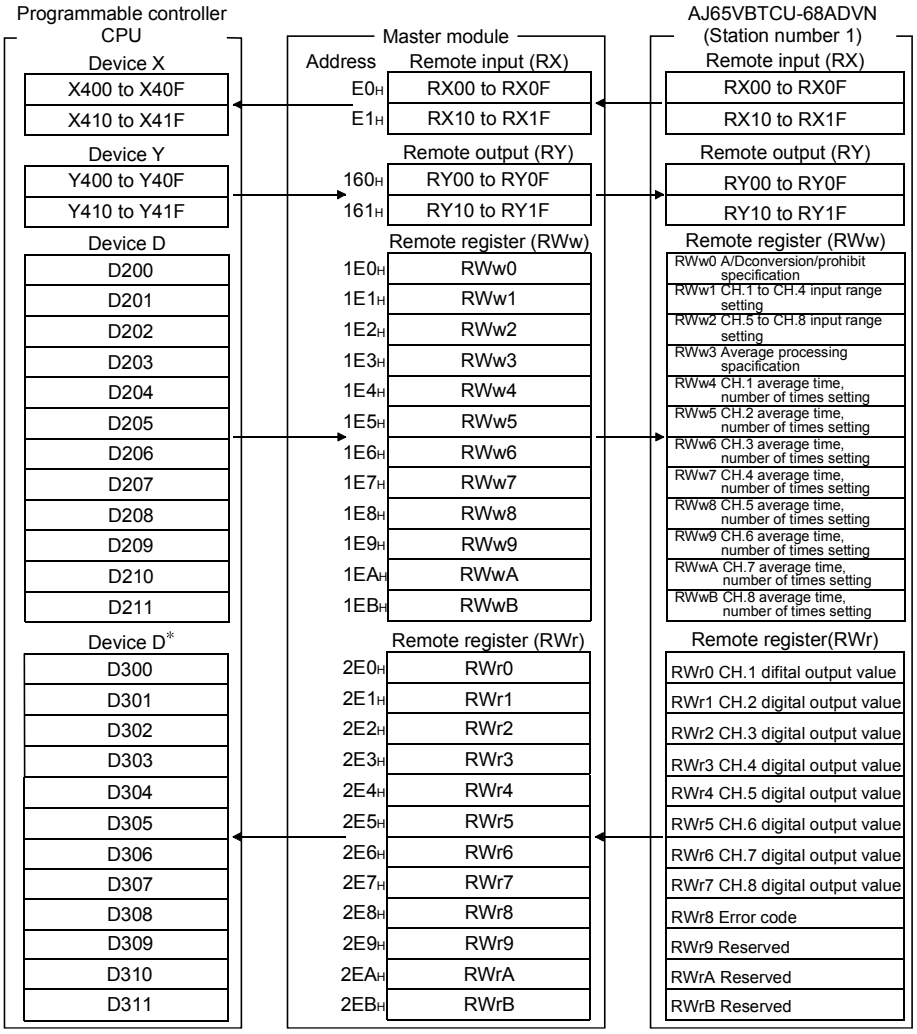
5.2.1 Conditions of Program Example

The program examples in this section are created under the following conditions.

(1) System configuration



(2) Relationships between programmable controller CPU, master module and AJ65VBTCU-68ADVN



*In the program example (refer to Section 5.2.4) that uses the RRPA instruction (automatic refresh parameter setting) with the ACPU/QCPU (A mode), RWr0 to RWr8 are assigned to D456 to D464.

POINT
Some CPU modules may not accept the devices used in the program example in this chapter. For the setting ranges of the devices, refer to the user's manual of the CPU module used.□For the A1SCPU, for example, devices X100, Y100 and later are unusable. Use such devices as B and M.

(3) Initial settings

Setting Item	Settings
A/D conversion enable/prohibit specification (RWw0)	A/D conversion enabled channel: Channel 1, 2
CH. 1 to CH. 4 input range setting (RWw1)	Channel 1: 0 to 5V Channel 2: User range setting 1
Average processing specification (RWw3)	Channel 1: Sampling processing Channel 2: Average processing, number of times average
CH. 2 average time, number of times setting (RWw5)	Number of average processing times of channel 2: 16 times

5.2.2 Program Example for Use of the QCPU (Q mode)

The program examples in this section are created under the following conditions.
GX Developer is used to set the network and automatic refresh parameters.
Using the remote device station initialization procedure registration function facilitates initial settings.

(1) Parameter setting

(a) Network parameter setting

	1
Start I/O No.	0000
Operational setting	Operational settings
Type	Master station
Master station data link type	PLC parameter auto start
Mode	Remote net(Ver.1 mode)
All connect count	1
Remote input(RX)	
Remote output(RY)	
Remote register(RWr)	
Remote register(RWw)	
Ver.2 Remote input(RX)	
Ver.2 Remote output(RY)	
Ver.2 Remote register(RWr)	
Ver.2 Remote register(RWw)	
Special relay(SB)	
Special register(SW)	
Retry count	3
Automatic reconnection station count	1
Stand by master station No.	
PLC down select	Stop
Scan mode setting	Asynchronous
Delay infomation setting	0
Station information setting	Station information
Remote device station initial setting	Initial settings
Interrupt setting	Interrupt settings

Station No.	Station type	Expanded cyclic setting	Exclusive station count	Remote station points	Reserve/invalid station select	Intelligent buffer select(word)		
						Send	Receive	Automatic
1/1	Remote device station	single	Exclusive station 3	96 points	No setting			

(b) Automatic refresh parameter setting

	1
Start I/O No.	0000
Operational setting	Operational settings
Type	Master station
Master station data link type	PLC parameter auto start
Mode	Remote net(Ver.1 mode)
All connect count	1
Remote input(RX)	X400
Remote output(RY)	Y400
Remote register(RWr)	D300
Remote register(RWw)	D200
Ver.2 Remote input(RX)	
Ver.2 Remote output(RY)	
Ver.2 Remote register(RWr)	
Ver.2 Remote register(RWw)	
Special relay(SB)	SB0
Special register(SW)	SW0
Retry count	3
Automatic reconnection station count	1
Stand by master station No.	
PLC down select	Stop
Scan mode setting	Asynchronous
Delay infomation setting	0
Station information setting	Station information
Remote device station initial setting	Initial settings
Interrupt setting	Interrupt settings

(2) Initial setting by remote device station initialization procedure registration

(a) Setting the target station number

Set the station number to which initial setting will be made.

Set the target station number to "1".

Remote device station initial setting: Target station number setting: Module 1

	Target station No.	No. of registered procedures			Target station No.	No. of registered procedures	
1	1		Regist procedure	9			Regist procedure
2			Regist procedure	10			Regist procedure

(b) Setting the procedure registration

When the initial data processing request flag (RX18) turns on and the remote device station initialization procedure registration (SB0D) is set, the following data are registered to the AJ65VBTCU-68ADVN/ADIN.

Procedure Execution Condition	Execution
Initial data processing request flag (RX18) turns on	A/D conversion enable/prohibit specification: channenls 1, 2: enable (RWw0 :0003H)
	CH.1 to CH.4 input range setting : channel 1: 0 to 5V : channel 2: user range setting 1 (RWw1: 31H)
	Average processing setting : channel 1: sampling processing : channel 2: average processing, average number of times (RWw3: 200H)
	CH.2 average time, number of times setting: channel 2: 16 times (RWw5: 10H)
	Initial data processing completion flag (RY18) is turned on.
	Initial data setting request flag (RY19) is turned on.
Initial data processing request flag (RX18) turns off	Initial data processing completion flag (RY18) is turned off.
Initial data setting completion flag (RX19) turns on	Initial data setting request flag (RY19) is turned off.

(c) Setting results

The setting results are shown below.

Remote device station initial setting: Procedure registration module 1: Target station 1

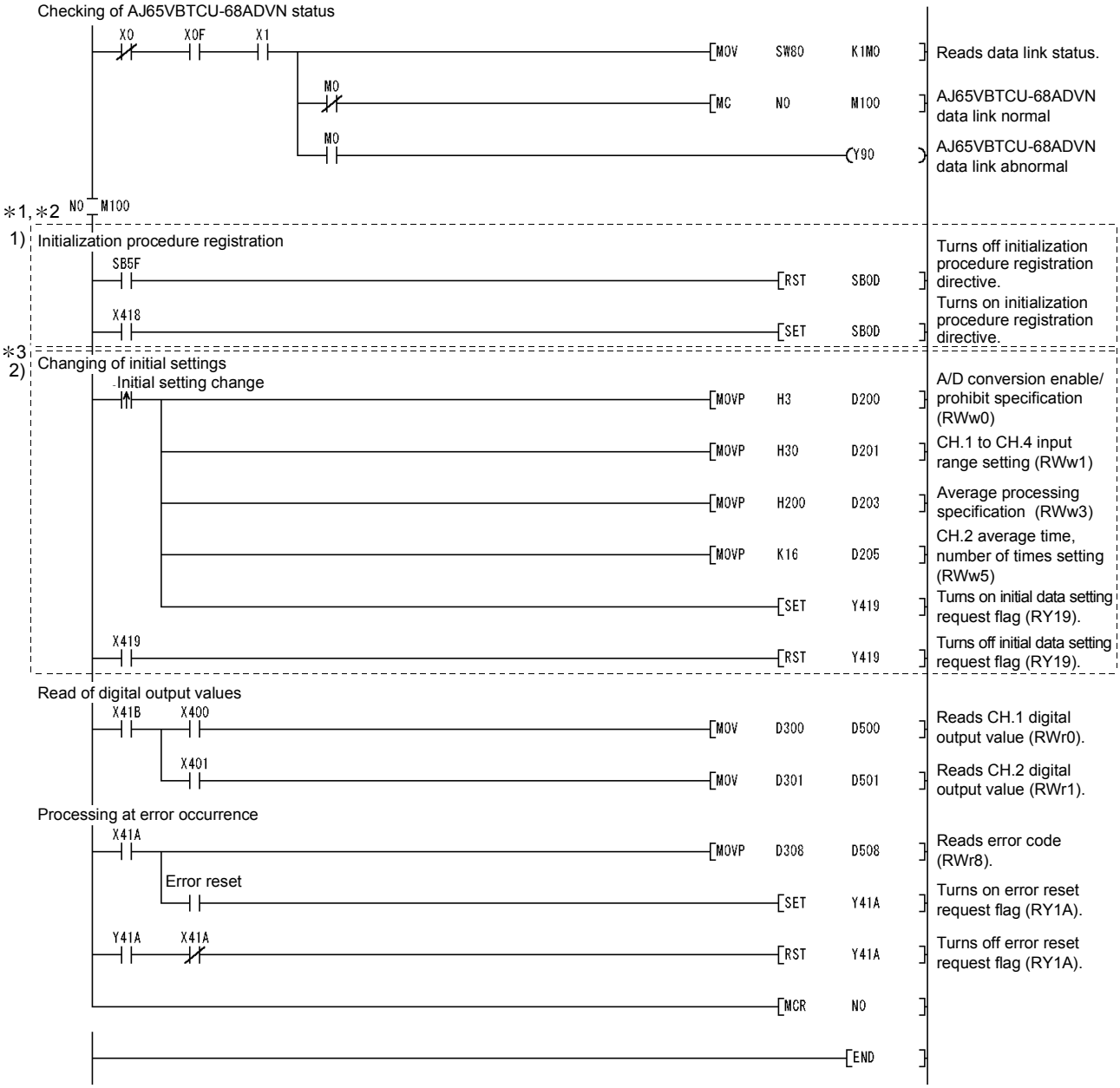
Input format: HEX.

Execute Flag	Operational condition	Executional condition: Condition Device	Condition Device Number	Execute Condition	Details of execution: Write Device	Device Number	Write Data
Execute	Set new	RX	18	ON	RWw	00	0003
Execute	Same as prev.set	RX	18	ON	RWw	01	0031
Execute	Same as prev.set	RX	18	ON	RWw	03	0200
Execute	Same as prev.set	RX	18	ON	RWw	05	0010
Execute	Same as prev.set	RX	18	ON	RY	18	ON
Execute	Same as prev.set	RX	18	ON	RY	19	ON
Execute	Set new	RX	18	OFF	RY	18	OFF
Execute	Set new	RX	19	ON	RY	19	OFF

POINT

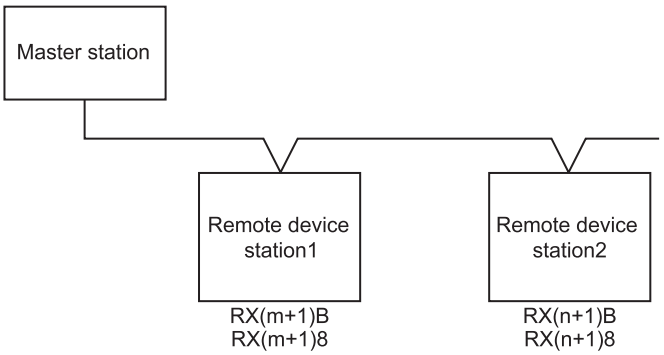
For the case where the remote device station initialization procedure registration function is not used but a sequence program is used to make setting, refer to the user's manual of the used master module.

(3) Program example

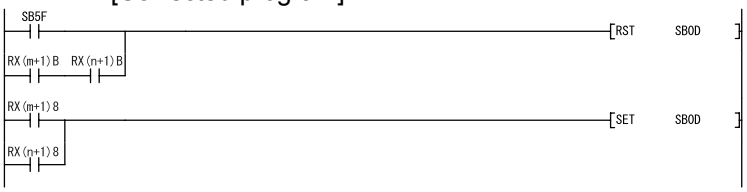


*1 When making remote device station initialization procedure registration to multiple stations, correct the program within the dotted line 1) as shown below.

[System configuration]



[Corrected program]



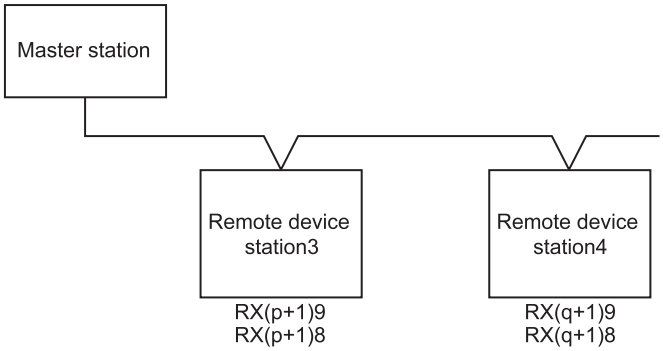
- RX(m+1)B and RX(n+1)B are remote READY.
- RX(m+1)8 and RX(n+1)8 are initial data processing request flags.

Insert the remote READY and initial data processing request flags for all the stations, to which the remote device station initialization procedure registration has been made, into the program.

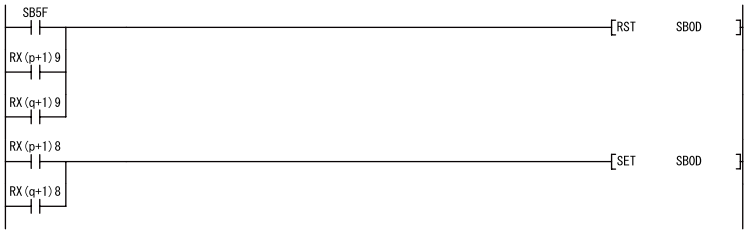
[Usage in combination with other remote device stations]

(1) Depending on the remote device stations to be used, the program enclosed by the dotted line 1) has two programming patterns as shown in the above and the below figures. (To check which pattern can be used, refer to the manual for the remote device to be used.)

[System configuration]



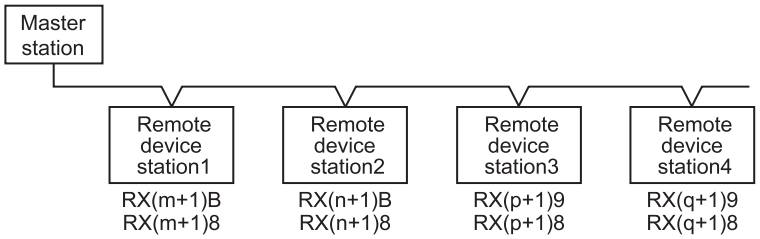
[Corrected program]



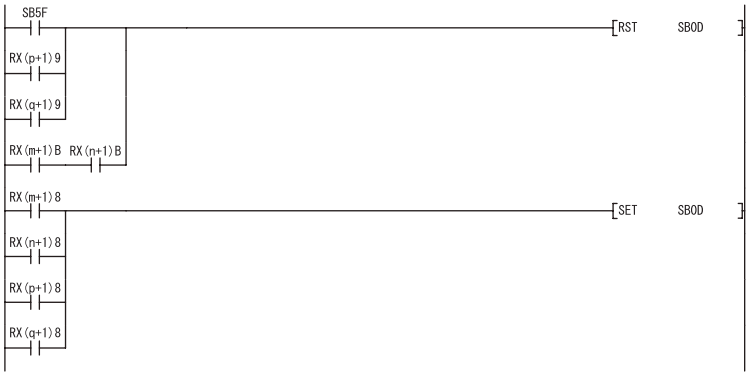
- RX(p+1)9 and RX(q+1)9 are initial data setting completion flags.
- RX(p+1)8 and RX(q+1)8 are initial data processing request flags.

(2) When using the program enclosed by the dotted line 1) in combination with other remote device stations, correct the program as shown below.

[System configuration]



[Corrected program]



Note that the master module can register the initialization procedure of only the specified station out of the multiple remote device stations.
The master module supporting this function is the QJ61BT11N which serial No's first 5 digits is 08032 or later.
For details, refer to the CC-Link System Master/Local Module User's Manual.

*2 Before the communication program is executed with remote device stations, the program enclosed by the dotted line 1) enables the initial setting by using the SB0D (remote device station initialization procedure registration instruction) and SB5F (completion status of remote device station initialization procedure). Initialization processing can't be made only by the parameter setting of GX Developer.

*3 The program enclosed by the dotted line 2) is necessary only when the initial settings are changed.

5.2.3 Program Example for Use of the QnACPU

GX Developer is used to set the network and automatic refresh parameters.

(1) Parameter setting

(a) Network parameter setting

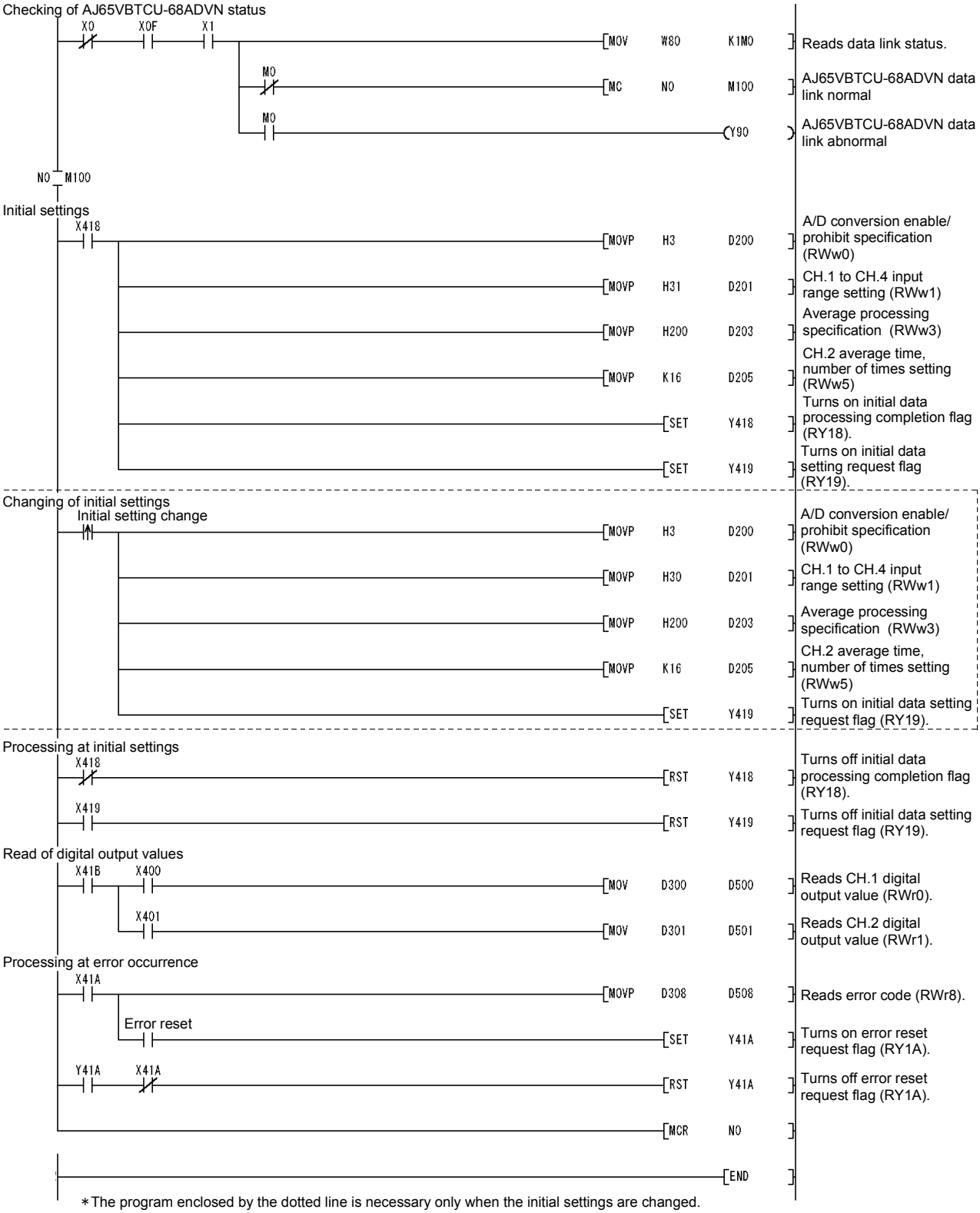
	1
Start I/O No.	0000
Type	Master station
All connect count	1
Remote input(RX)	
Remote output(RY)	
Remote register(RWr)	
Remote register(RWw)	
Special relay(SB)	
Special register(SW)	
Retry count	3
Automatic reconnection station count	1
Wait master station No.	0
PLC down select	Stop
Scan mode setting	Asynchronously
Delay information setting	0
Station information setting	Station information

StationNo.	Station type	Exclusive station count	Reserve/invalid station select	Intelligent buffer select(word)		
				Send	Receive	Automatic
1/1	Remote device station	Exclusive station 3	No setting			

(b) Automatic refresh parameter setting

	1
Start I/O No.	0000
Type	Master station
All connect count	1
Remote input(RX)	X400
Remote output(RY)	Y400
Remote register(RWr)	D300
Remote register(RWw)	D200
Special relay(SB)	B0
Special register(SW)	W0
Retry count	3
Automatic reconnection station count	1
Wait master station No.	0
PLC down select	Stop
Scan mode setting	Asynchronously
Delay information setting	0
Station information setting	Station information

(2) Program example

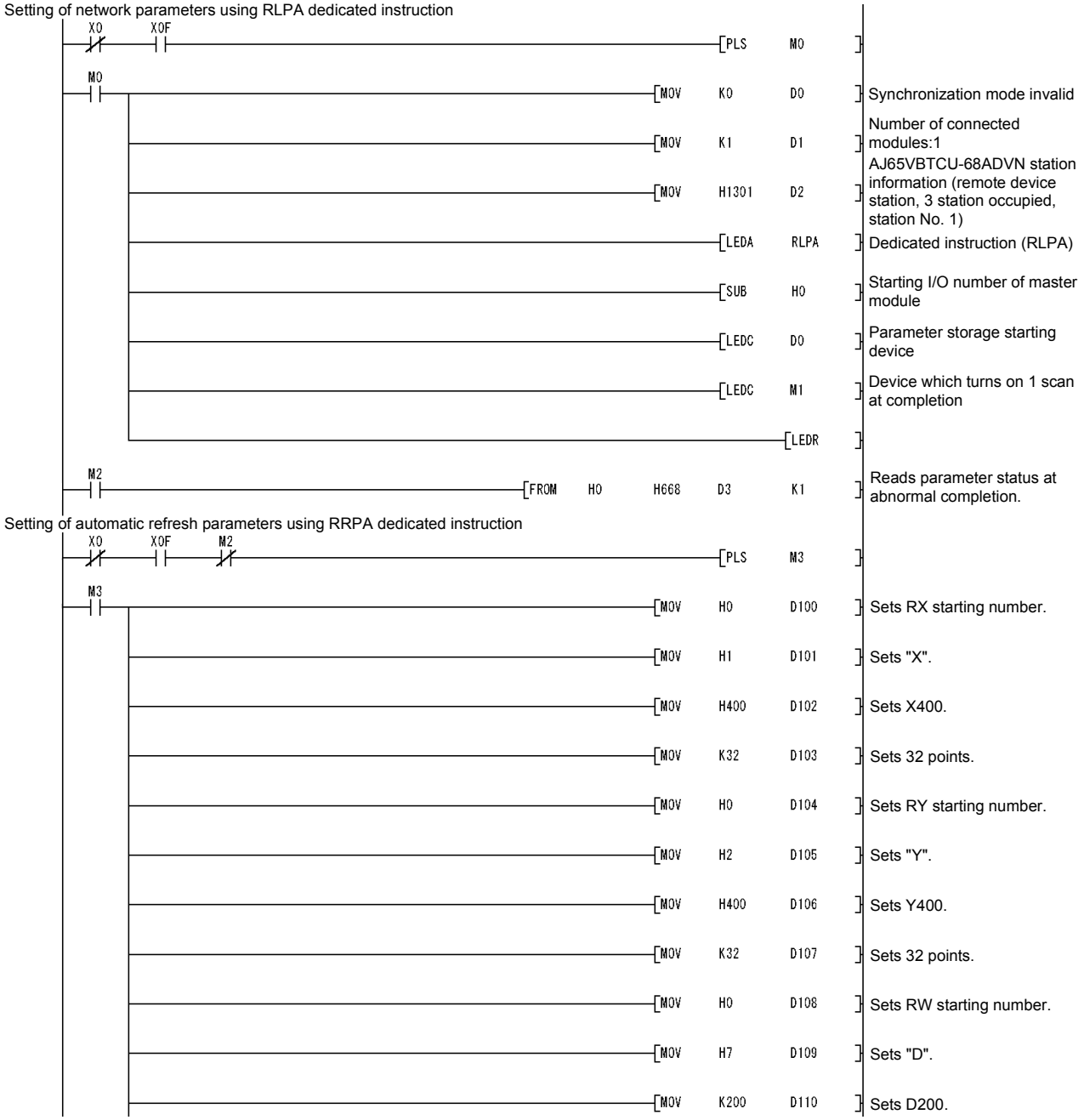


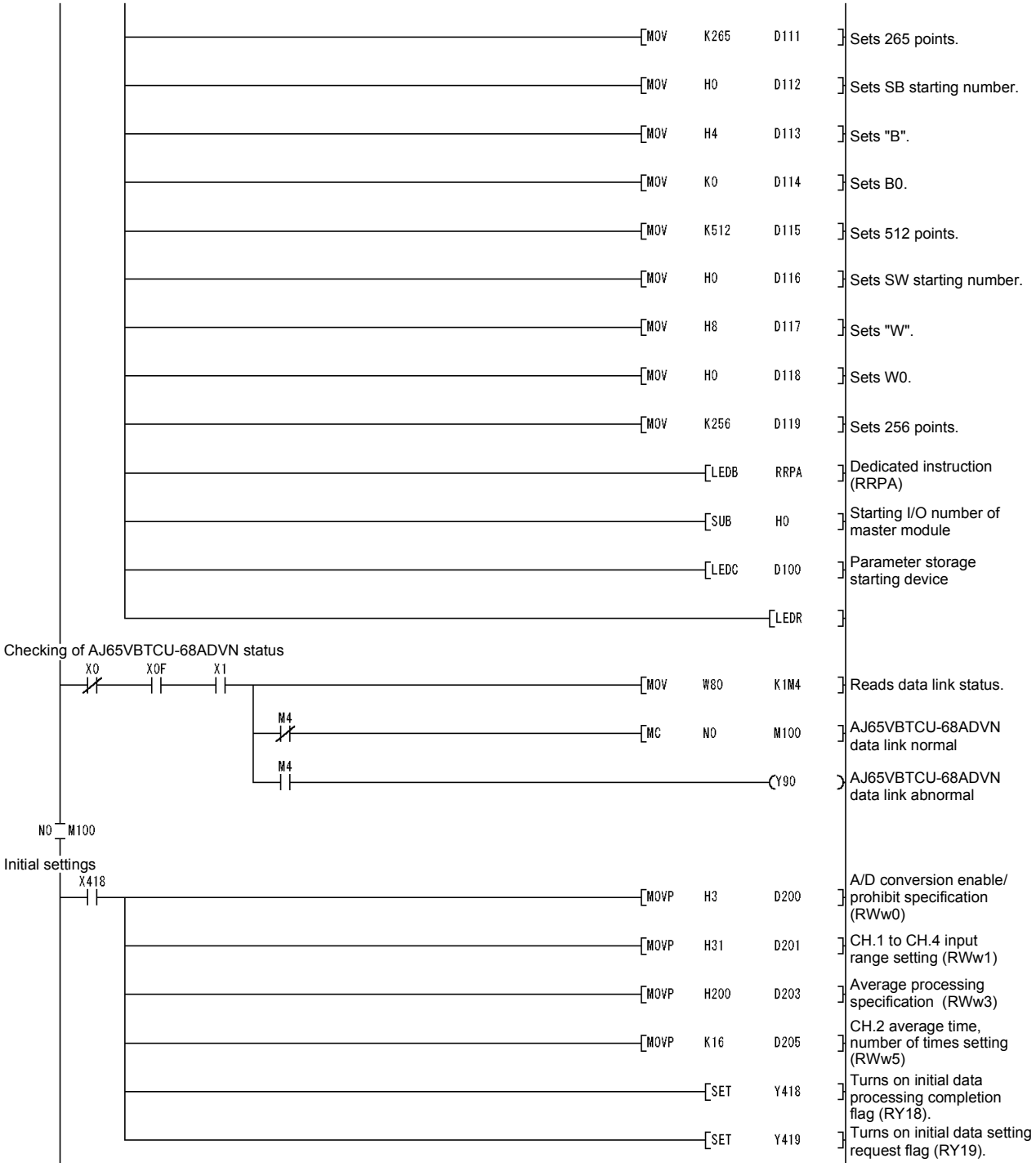
∗The program enclosed by the dotted line is necessary only when the initial settings are changed.

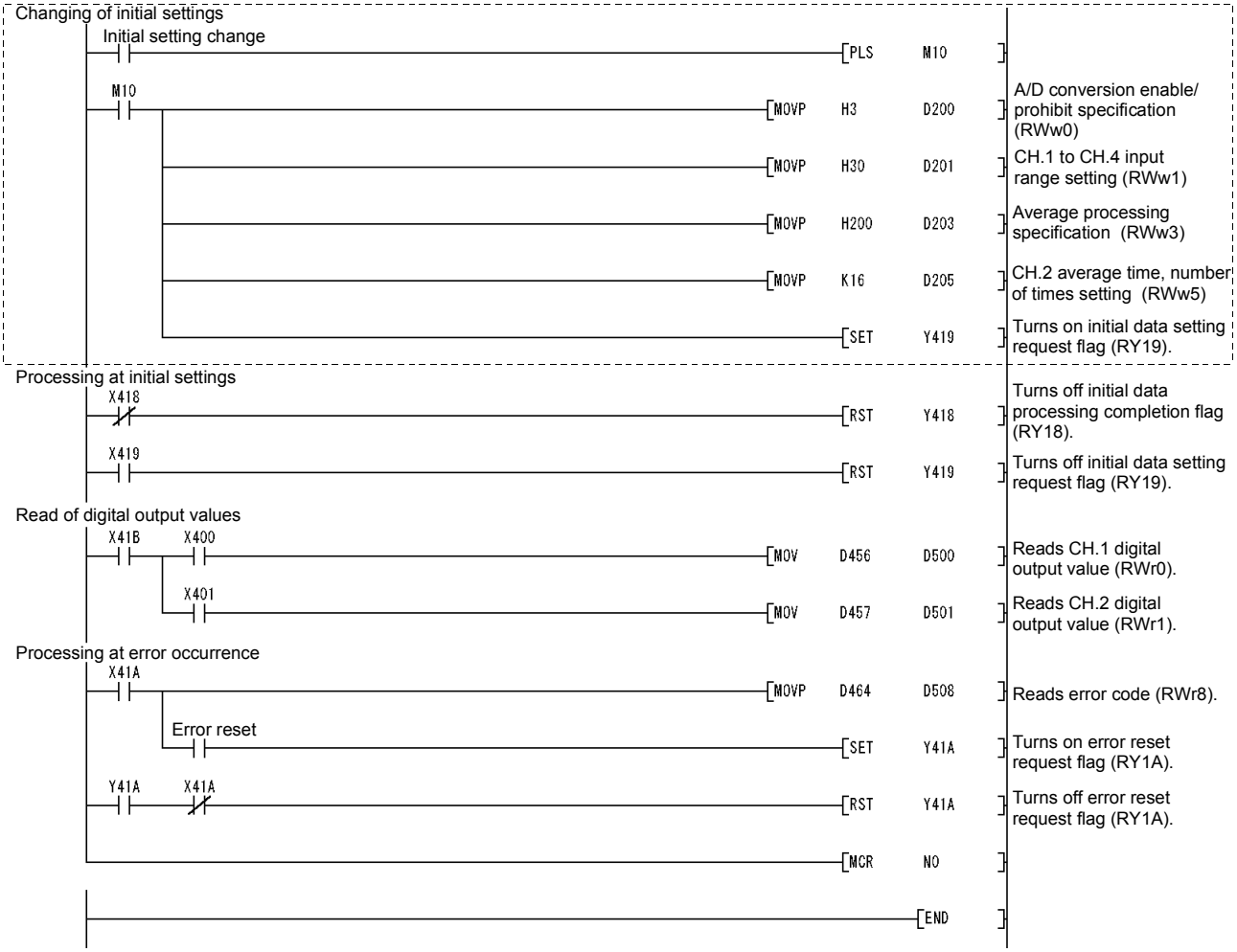
5.2.4 Program Example for Use of the ACPU/QCPU (A mode) (dedicated instructions)

A sequence program is used to set the network and automatic refresh parameters.

(1) Program example




MOV K265 D111
Sets 265 points.
MOV H0 D112
Sets SB starting number.
MOV H4 D113
Sets "B".
MOV K0 D114
Sets B0.
MOV K512 D115
Sets 512 points.
MOV H0 D116
Sets SW starting number.
MOV H8 D117
Sets "W".
MOV H0 D118
Sets W0.
MOV K256 D119
Sets 256 points.
LEDB RRPA
Dedicated instruction (RRPA)
SUB H0
Starting I/O number of master module
LEDC D100
Parameter storage starting device
LEDR
Checking of AJ65VBTCU-68ADVN status
X0 X0F X1
MOV W80 K1M4
Reads data link status.
M4
MC N0 M100
AJ65VBTCU-68ADVN data link normal
M4
Y90
AJ65VBTCU-68ADVN data link abnormal
N0 M100
Initial settings
X418
MOVP H3 D200
A/D conversion enable/ prohibit specification (RWw0)
MOVP H31 D201
CH.1 to CH.4 input range setting (RWw1)
MOVP H200 D203
Average processing specification (RWw3)
MOVP K16 D205
CH.2 average time, number of times setting (RWw5)
SET Y418
Turns on initial data processing completion flag (RY18).
SET Y419
Turns on initial data setting request flag (RY19).

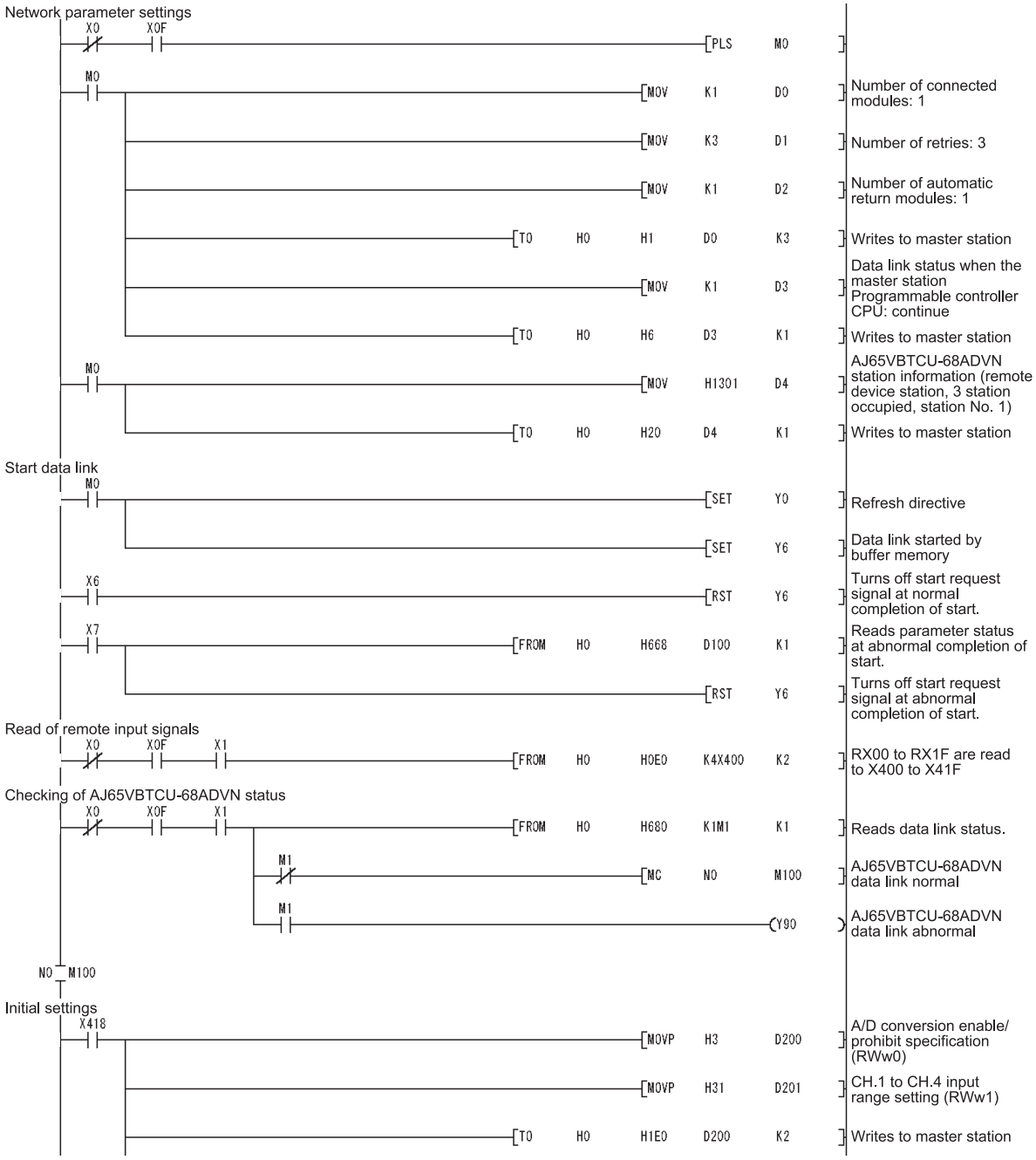


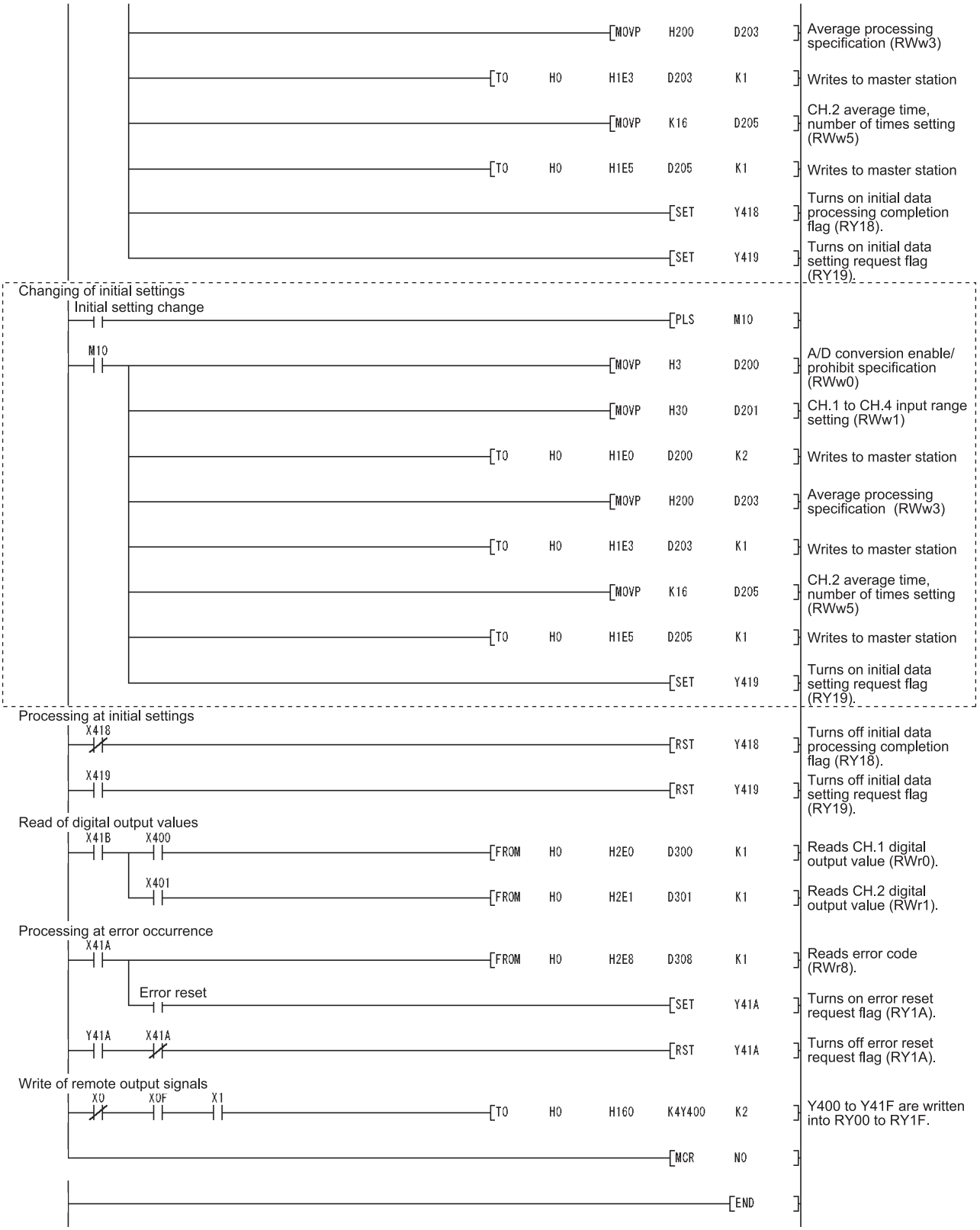
∗The program enclosed by the dotted line is necessary only when the initial settings are changed.

5.2.5 Program Example for Use of the ACPU/QCPU (A mode) (FROM/TO instructions)

A sequence program is used to set the network parameters.

(1) Program example


Network parameter settings
X0 X0F PLS M0
M0 MOV K1 D0 Number of connected modules: 1
MOV K3 D1 Number of retries: 3
MOV K1 D2 Number of automatic return modules: 1
TO H0 H1 D0 K3 Writes to master station
MOV K1 D3 Data link status when the master station Programmable controller CPU: continue
TO H0 H6 D3 K1 Writes to master station
M0 MOV H1301 D4 AJ65VBTCU-68ADVN station information (remote device station, 3 station occupied, station No. 1)
TO H0 H20 D4 K1 Writes to master station
Start data link
M0 SET Y0 Refresh directive
SET Y6 Data link started by buffer memory
X6 RST Y6 Turns off start request signal at normal completion of start.
X7 FROM H0 H668 D100 K1 Reads parameter status at abnormal completion of start.
RST Y6 Turns off start request signal at abnormal completion of start.
Read of remote input signals
X0 X0F X1 FROM H0 H0E0 K4X400 K2 RX00 to RX1F are read to X400 to X41F
Checking of AJ65VBTCU-68ADVN status
X0 X0F X1 FROM H0 H680 K1M1 K1 Reads data link status.
M1 MC N0 M100 AJ65VBTCU-68ADVN data link normal
M1 Y90 AJ65VBTCU-68ADVN data link abnormal
N0 M100
Initial settings
X418 MOVP H3 D200 A/D conversion enable/ prohibit specification (RWw0)
MOVP H31 D201 CH.1 to CH.4 input range setting (RWw1)
TO H0 H1E0 D200 K2 Writes to master station


MOVP H200 D203
Average processing specification (RWw3)
TO H0 H1E3 D203 K1
Writes to master station
MOVP K16 D205
CH.2 average time, number of times setting (RWw5)
TO H0 H1E5 D205 K1
Writes to master station
SET Y418
Turns on initial data processing completion flag (RY18).
SET Y419
Turns on initial data setting request flag (RY19).
Changing of initial settings
Initial setting change
PLS M10
M10
MOVP H3 D200
A/D conversion enable/ prohibit specification (RWw0)
MOVP H30 D201
CH.1 to CH.4 input range setting (RWw1)
TO H0 H1E0 D200 K2
Writes to master station
MOVP H200 D203
Average processing specification (RWw3)
TO H0 H1E3 D203 K1
Writes to master station
MOVP K16 D205
CH.2 average time, number of times setting (RWw5)
TO H0 H1E5 D205 K1
Writes to master station
SET Y419
Turns on initial data setting request flag (RY19).
Processing at initial settings
X418
RST Y418
Turns off initial data processing completion flag (RY18).
X419
RST Y419
Turns off initial data setting request flag (RY19).
Read of digital output values
X41B X400
FROM H0 H2E0 D300 K1
Reads CH.1 digital output value (RWr0).
X401
FROM H0 H2E1 D301 K1
Reads CH.2 digital output value (RWr1).
Processing at error occurrence
X41A
FROM H0 H2E8 D308 K1
Reads error code (RWr8).
Error reset
SET Y41A
Turns on error reset request flag (RY1A).
Y41A X41A
RST Y41A
Turns off error reset request flag (RY1A).
Write of remote output signals
X0 X0F X1
TO H0 H160 K4Y400 K2
Y400 to Y41F are written into RY00 to RY1F.
MCR N0
END

∗ The program enclosed by the dotted line is necessary only when the initial settings are changed.

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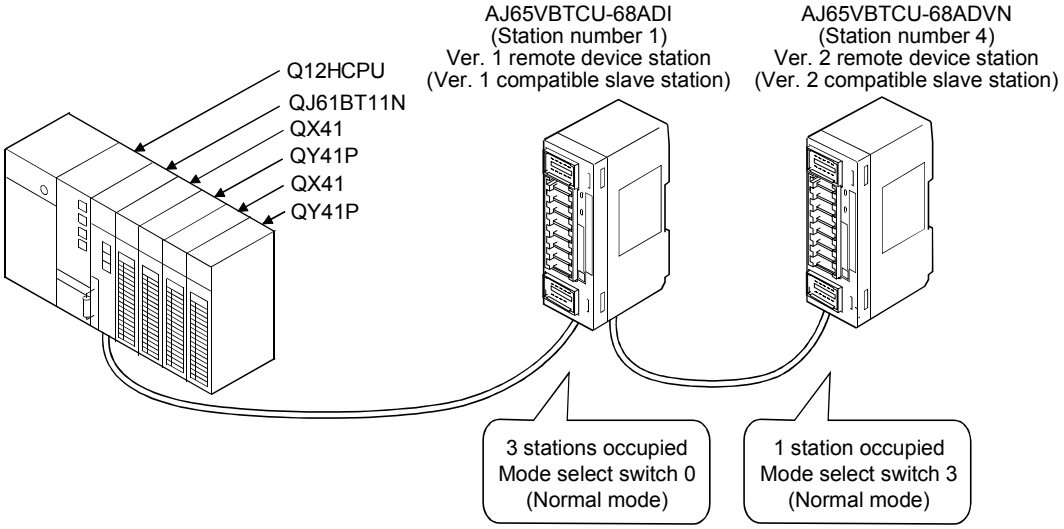
5.3 When Remote Net Ver. 2 Mode Is Used

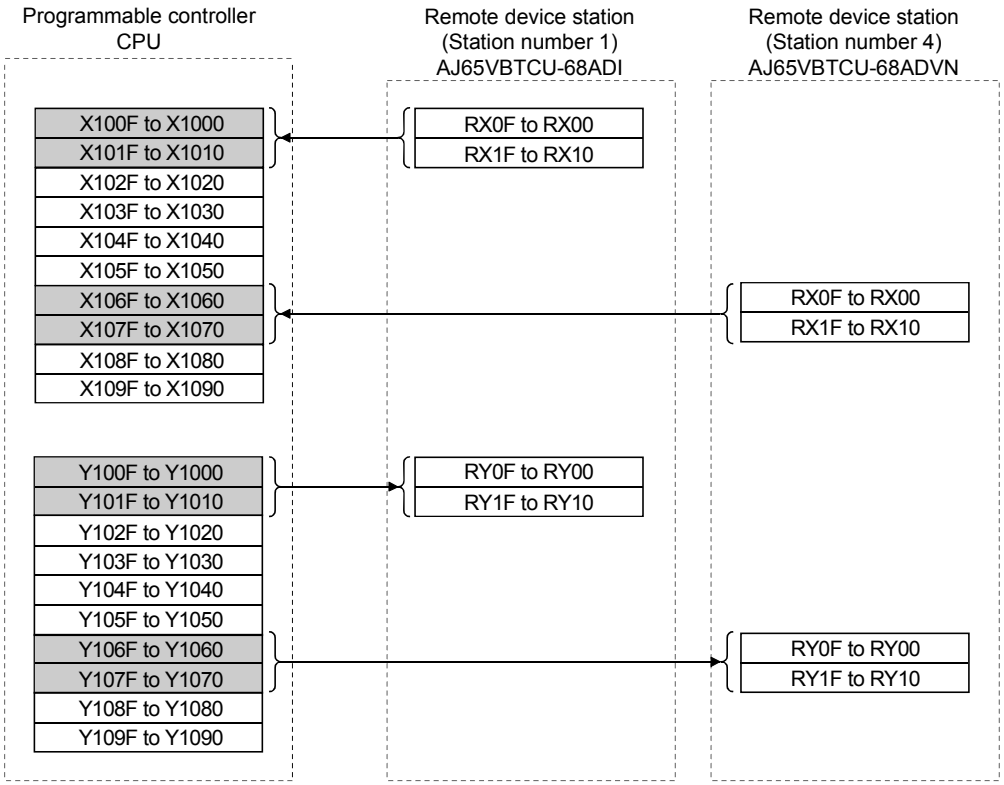
5.3.1 Conditions of program examples

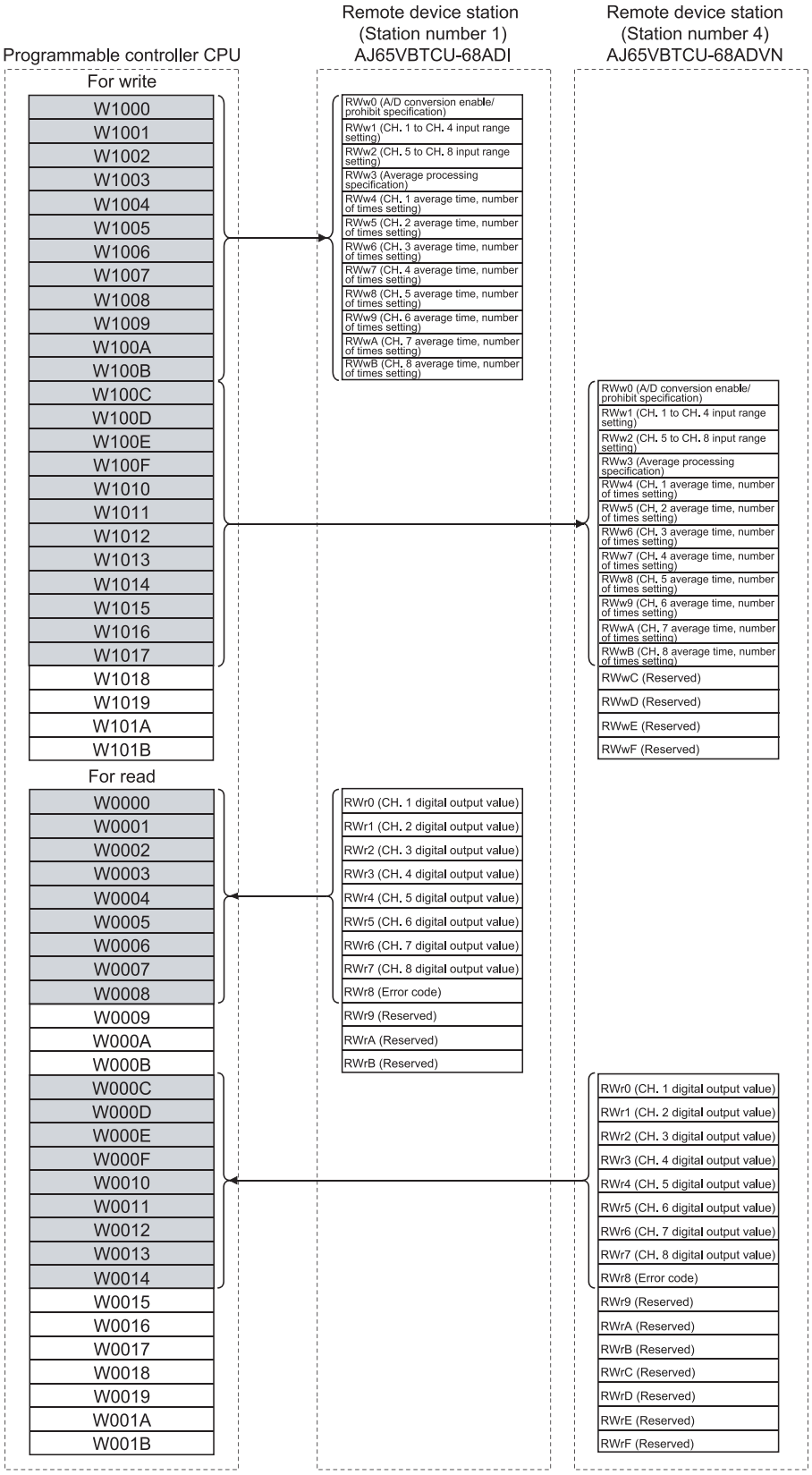
The program examples in this section are created under the following conditions.

(1) System configuration



(2) Relationships between programmable controller CPU, AJ65VBTCU-68ADI and AJ65VBTCU-68ADVN




Programmable controller CPU
Remote device station (Station number 1) AJ65VBTCU-68ADI
Remote device station (Station number 4) AJ65VBTCU-68ADVN
For write
W1000
W1001
W1002
W1003
W1004
W1005
W1006
W1007
W1008
W1009
W100A
W100B
W100C
W100D
W100E
W100F
W1010
W1011
W1012
W1013
W1014
W1015
W1016
W1017
W1018
W1019
W101A
W101B
RWw0 (A/D conversion enable/ prohibit specification)
RWw1 (CH. 1 to CH. 4 input range setting)
RWw2 (CH. 5 to CH. 8 input range setting)
RWw3 (Average processing specification)
RWw4 (CH. 1 average time, number of times setting)
RWw5 (CH. 2 average time, number of times setting)
RWw6 (CH. 3 average time, number of times setting)
RWw7 (CH. 4 average time, number of times setting)
RWw8 (CH. 5 average time, number of times setting)
RWw9 (CH. 6 average time, number of times setting)
RWwA (CH. 7 average time, number of times setting)
RWwB (CH. 8 average time, number of times setting)
RWwC (Reserved)
RWwD (Reserved)
RWwE (Reserved)
RWwF (Reserved)
For read
W0000
W0001
W0002
W0003
W0004
W0005
W0006
W0007
W0008
W0009
W000A
W000B
W000C
W000D
W000E
W000F
W0010
W0011
W0012
W0013
W0014
W0015
W0016
W0017
W0018
W0019
W001A
W001B
RWr0 (CH. 1 digital output value)
RWr1 (CH. 2 digital output value)
RWr2 (CH. 3 digital output value)
RWr3 (CH. 4 digital output value)
RWr4 (CH. 5 digital output value)
RWr5 (CH. 6 digital output value)
RWr6 (CH. 7 digital output value)
RWr7 (CH. 8 digital output value)
RWr8 (Error code)
RWr9 (Reserved)
RWrA (Reserved)
RWrB (Reserved)
RWrC (Reserved)
RWrD (Reserved)
RWrE (Reserved)
RWrF (Reserved)

(3) Initial settings

Remote Device Station	Setting Item	Settings
AJ65VBTCU-68ADI	A/D conversion enable/prohibit specification (RWw0)	A/D conversion enable channel: Channel 1, 2
	CH. 1 to CH. 4 input range setting (RWw1)	Channel 1: 4 to 20mA Channel 2: User range setting
	Average processing specification (RWw3)	Channel 1: Sampling processing Channel 2: Average processing, number of times averaging
	CH. 2 average time, number of times setting (RWw5)	Number of average processing times of channel 2: 16 times
AJ65VBTCU-68ADVN	A/D conversion enable/prohibit specification (RWw0)	A/D conversion enable channel: Channel 1, 2
	CH. 1 to CH. 4 input range setting (RWw1)	Channel 1: 0 to 5V Channel 2: User range setting 1
	Average processing specification (RWw3)	Channel 1: Sampling processing Channel 2: Average processing, number of times averaging
	CH. 2 average time, number of times setting (RWw5)	Number of average processing times of channel 2: 16 times

POINT

When using the AJ65VBTCU-68ADVN as the ver. 2 remote device station in the normal mode, set the mode select switch to "3".

5.3.2 Setting of parameters and initialization procedure registration

The network parameters and automatic refresh parameters are set using GX Developer.
Use of the remote device station initialization procedure registration function makes initial setting easy.

(1) Parameter setting

(a) Network parameter setting

	1
Start I/O No.	0000
Operational setting	Operational settings
Type	Master station
Master station data link type	PLC parameter auto start
Mode	Remote net(Ver.2 mode)
All connect count	2
Remote input(RX)	
Remote output(RY)	
Remote register(RWr)	
Remote register(RWw)	
Ver.2 Remote input(RX)	
Ver.2 Remote output(RY)	
Ver.2 Remote register(RWr)	
Ver.2 Remote register(RWw)	
Special relay(SB)	
Special register(SW)	
Retry count	3
Automatic reconnection station count	1
Stand by master station No.	
PLC down select	Stop
Scan mode setting	Asynchronous
Delay infomation setting	0
Station information setting	Station information
Remote device station initial setting	Initial settings
Interrupt setting	Interrupt settings

Station No.	Station type	Expanded cyclic setting	Exclusive station count	Remote station points	Reserve/invalid station select	Intelligent buffer select(word) Send	Receive	Automatic
1/ 1	Ver.1Remote device station	single	Exclusive station 3	96 points	No setting			
2/ 4	Ver.2Remote device station	quadruple	Exclusive station 1	64 points	No setting			

(b) Automatic refresh parameter setting

	1
Start I/O No.	0000
Operational setting	Operational settings
Type	Master station
Master station data link type	PLC parameter auto start
Mode	Remote net(Ver.2 mode)
All connect count	2
Remote input(RX)	X1000
Remote output(RY)	Y1000
Remote register(RWr)	W0
Remote register(RWw)	W1000
Ver.2 Remote input(RX)	
Ver.2 Remote output(RY)	
Ver.2 Remote register(RWr)	
Ver.2 Remote register(RWw)	
Special relay(SB)	SB0
Special register(SW)	SW0
Retry count	3
Automatic reconnection station count	1
Stand by master station No.	
PLC down select	Stop
Scan mode setting	Asynchronous
Delay infomation setting	0
Station information setting	Station information
Remote device station initial setting	Initial settings
Interrupt setting	Interrupt settings

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(2) Initial setting by remote device station initialization procedure registration function

(a) Setting of target station numbers

Set the station numbers to which initial setting will be made.

Set the target station numbers to "1" and "4".

	Target station No.	No. of registered procedures			Target station No.	No. of registered procedures	
1	1	0	Regist procedure	9			Regist procedure
2	4	0	Regist procedure	10			Regist procedure
3			Regist procedure	11			Regist procedure

(b) Selection of procedure registration (part 1)

Make setting for the AJ65VBTCU-68ADI.

Click Procedure registration of target station number "1".

(c) Setting of procedure registration (part 1)

Set the conditions and execution for the AJ65VBTCU-68ADI.

When the initial data processing request flag (RX18) turns ON and Remote device station initialization procedure registration (SB0D) is set, the following data are registered to the AJ65VBTCU-68ADI.

Procedure Execution Condition in AJ65VBTCU-68ADI	Execution Data
Initial data processing request flag (RX18) turns ON	A/D conversion enable/prohibit specification: Channel 1, 2: Enable (RWw0 :0003H)
	CH.1 to CH.4 input range setting : channel 1: 4 to 20mA : channel 2: user range setting (RWw1: 20H)
	Average processing specification : channel 1: sampling processing : Channel 2: Average processing, number of times averaging (RWw3: 200H)
	CH. 2 average time, number of times setting: Channel 2: 16 times (RWw5: 10H)
	Initial data processing completion flag (RY18) is turned ON.
	Initial data processing request flag (RY19) is turned ON.
Initial data processing request flag (RX18) turns OFF	Initial data processing completion flag (RY18) is turned OFF.
Initial data setting completion flag (RX19) turns ON	Initial data setting request flag (RY19) is turned OFF.

(d) Setting result (part 1)

The following indicates the setting result of the AJ65VBTCU-68ADI.

Remote device station initial setting: Procedure registration module 1: Target station 1

Input format: HEX.

Execute Flag	Operational condition	Executional condition: Condition Device	Executional condition: Device Number	Executional condition: Execute Condition	Details of execution: Write Device	Details of execution: Device Number	Details of execution: Write Data
Execute	Set new	RX	18	ON	RWw	00	0003
Execute	Same as prev.set	RX	18	ON	RWw	01	0020
Execute	Same as prev.set	RX	18	ON	RWw	03	0200
Execute	Same as prev.set	RX	18	ON	RWw	05	0010
Execute	Same as prev.set	RX	18	ON	RY	18	ON
Execute	Same as prev.set	RX	18	ON	RY	19	ON
Execute	Set new	RX	18	OFF	RY	18	OFF
Execute	Set new	RX	19	ON	RY	19	OFF

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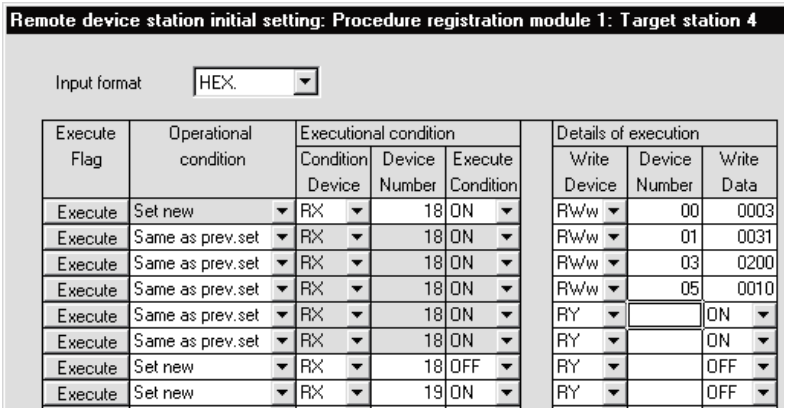
(e) Selection of procedure registration (part 2)
Make setting for the AJ65VBTCU-68ADVN.
Click Procedure registration of target station number "4".

(f) Setting of procedure registration (part 2)
Set the conditions and execution for the AJ65VBTCU-68ADVN.

When the initial data processing request flag (RX18) turns ON and Remote device station initialization procedure registration (SB0D) is set, the following data are registered to the AJ65VBTCU-68ADVN.

Procedure Execution Condition in AJ65VBTCU-68ADVN	Execution Data
Initial data processing request flag (RX18) turns ON	A/D conversion enable/prohibit specification: Channel 1, 2: Enable (RWw0 :0003H)
	CH. 1 to CH. 4 input range setting : Channel 1: 0 to 5V : Channel 2: User range setting 1 (RWw1: 31H)
	Average processing specification : Channel 1: Sampling processing : Channel 2: Average processing, number of times averaging (RWw3: 200H)
	CH. 2 average time, number of times setting: Channel 2: 16 times (RWw5: 10H)
	Initial data processing completion flag (RY18) is turned ON.
	Initial data setting request flag (RY19) is turned ON.
Initial data processing request flag (RX18) turns OFF	Initial data processing completion flag (RY18) is turned OFF.
Initial data setting completion flag (RX19) turns ON	Initial data setting request flag (RY19) is turned OFF.

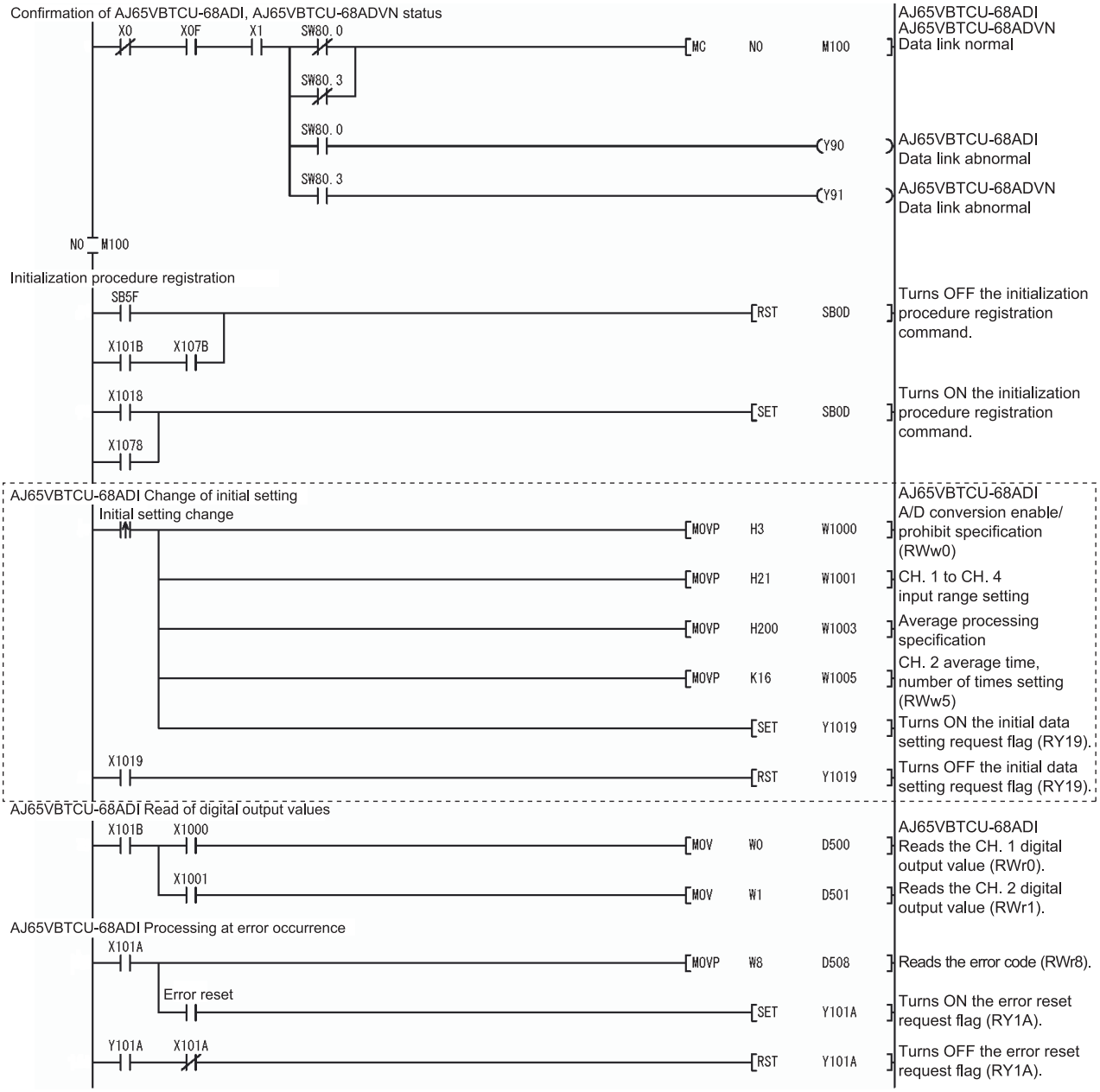
(g) Setting result (part 2)
The following indicates the setting result of the AJ65VBTCU-68ADVN.


Remote device station initial setting: Procedure registration module 1: Target station 4
Input format
HEX.
Execute Flag
Operational condition
Executional condition
Condition Device
Device Number
Execute Condition
Details of execution
Write Device
Device Number
Write Data
Execute | Set new | RX | 18 | ON | RWw | 00 | 0003
Execute | Same as prev.set | RX | 18 | ON | RWw | 01 | 0031
Execute | Same as prev.set | RX | 18 | ON | RWw | 03 | 0200
Execute | Same as prev.set | RX | 18 | ON | RWw | 05 | 0010
Execute | Same as prev.set | RX | 18 | ON | RY | | ON
Execute | Same as prev.set | RX | 18 | ON | RY | | ON
Execute | Set new | RX | 18 | OFF | RY | | OFF
Execute | Set new | RX | 19 | ON | RY | | OFF

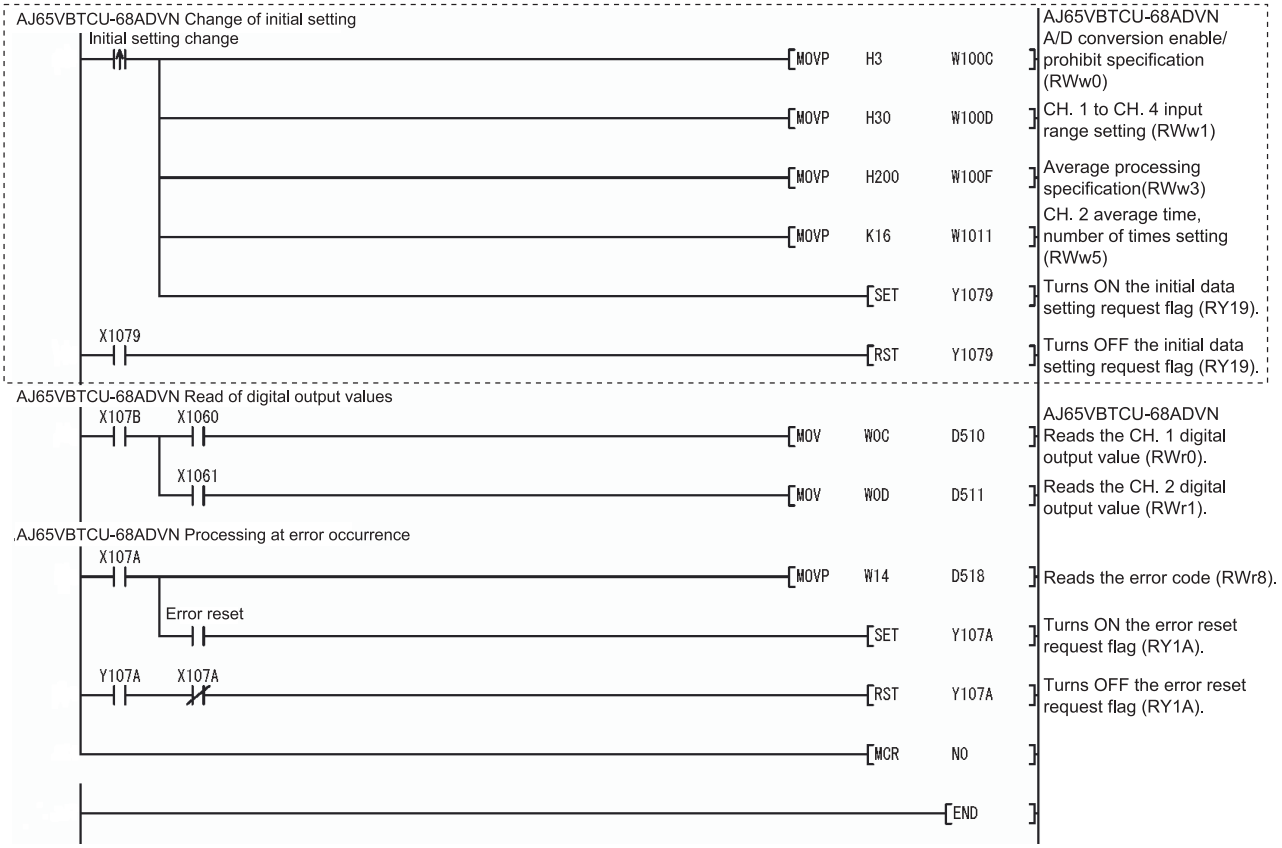
POINT

For the case where the remote device station initialization procedure registration function is not used but a sequence program is used to make setting, refer to the user's manual of the used master module.

5.3.3 Program example



∗ The program part enclosed by the dotted line is required only when the initial setting is changed.


AJ65VBTCU-68ADVN Change of initial setting
Initial setting change
MOVP H3 W100C
MOVP H30 W100D
MOVP H200 W100F
MOVP K16 W1011
SET Y1079
X1079
RST Y1079
AJ65VBTCU-68ADVN A/D conversion enable/ prohibit specification (RWw0)
CH. 1 to CH. 4 input range setting (RWw1)
Average processing specification(RWw3)
CH. 2 average time, number of times setting (RWw5)
Turns ON the initial data setting request flag (RY19).
Turns OFF the initial data setting request flag (RY19).
AJ65VBTCU-68ADVN Read of digital output values
X107B X1060
MOV W0C D510
X1061
MOV W0D D511
AJ65VBTCU-68ADVN Reads the CH. 1 digital output value (RWr0).
Reads the CH. 2 digital output value (RWr1).
AJ65VBTCU-68ADVN Processing at error occurrence
X107A
MOVP W14 D518
Error reset
SET Y107A
Y107A X107A
RST Y107A
MCR N0
END
Reads the error code (RWr8).
Turns ON the error reset request flag (RY1A).
Turns OFF the error reset request flag (RY1A).

* The program part enclosed by the dotted line is required only when the initial setting is changed.

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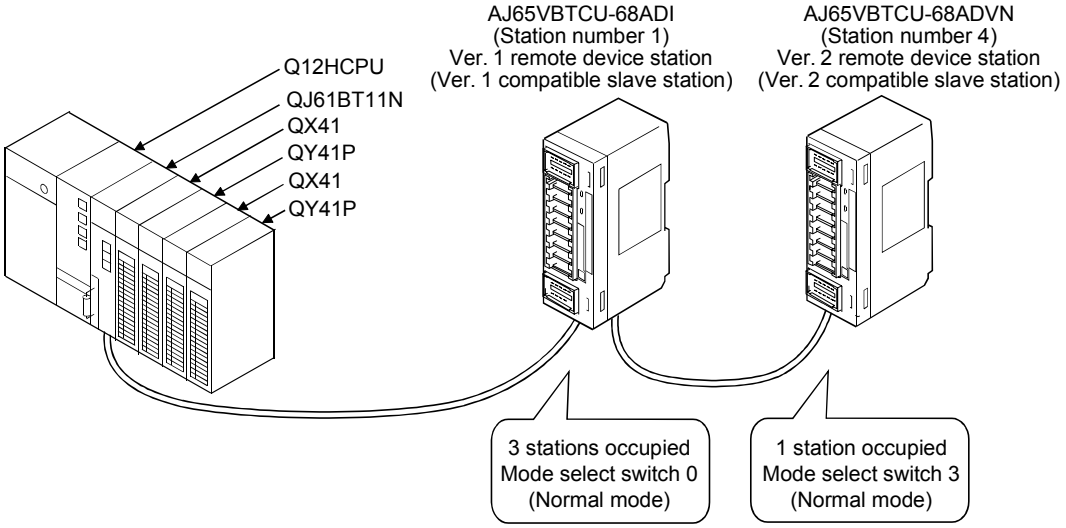
5.4 When Remote Net Additional Mode Is Used

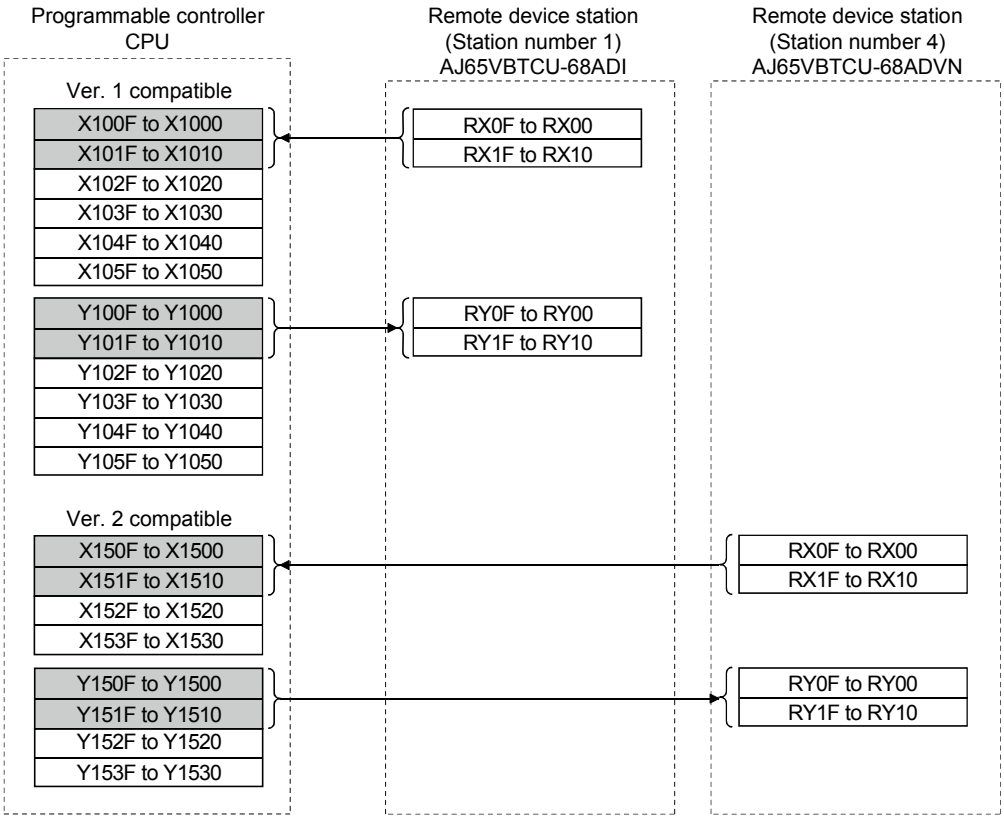
5.4.1 Conditions of program examples

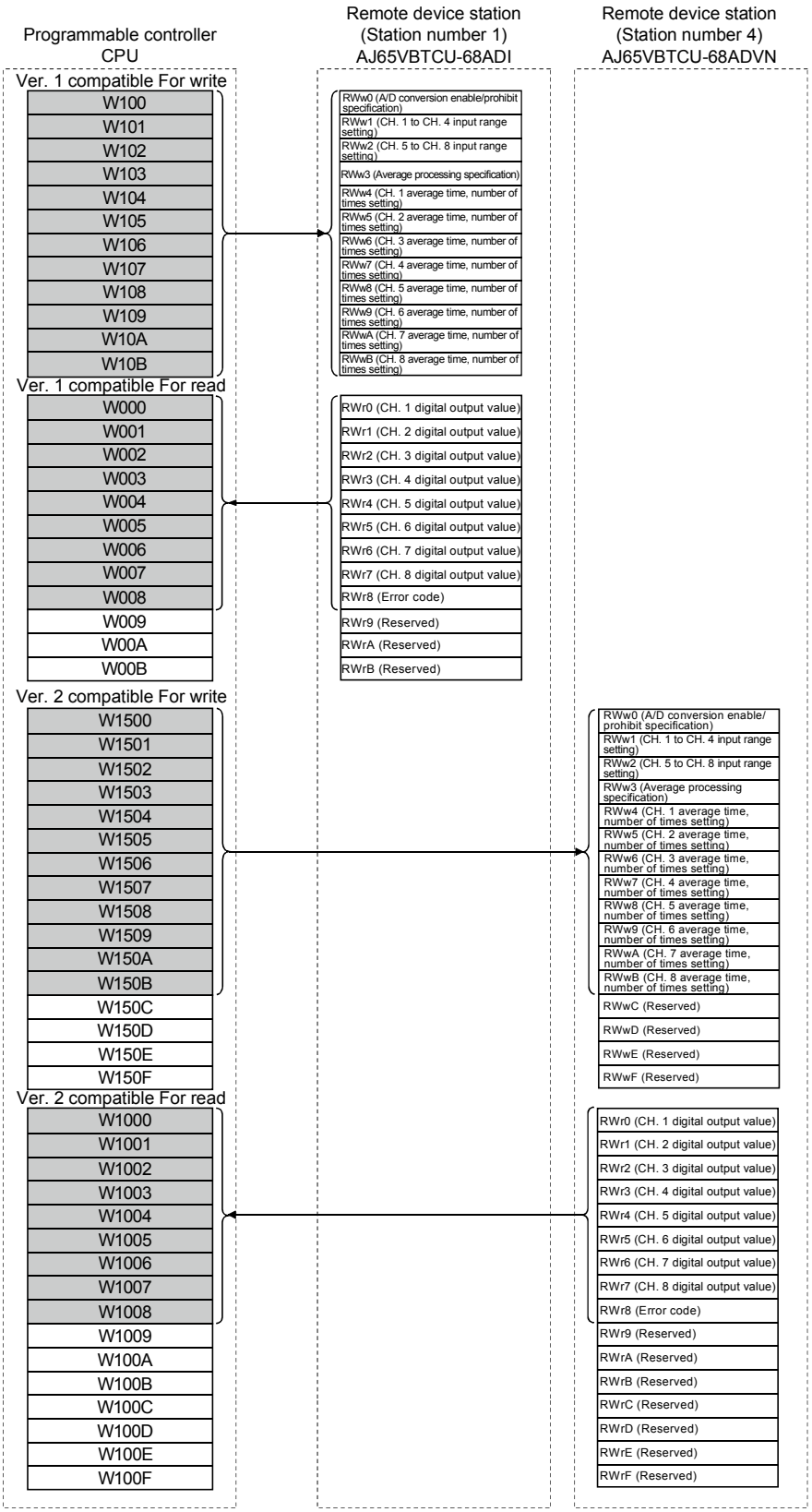
The program examples in this section are created under the following conditions.

(1) System configuration



(2) Relationships between programmable controller CPU, AJ65VBTCU-68ADI and AJ65VBTCU-68ADVN




Programmable controller CPU
Remote device station (Station number 1) AJ65VBTCU-68ADI
Remote device station (Station number 4) AJ65VBTCU-68ADVN
Ver. 1 compatible For write
W100
W101
W102
W103
W104
W105
W106
W107
W108
W109
W10A
W10B
RWw0 (A/D conversion enable/prohibit specification)
RWw1 (CH. 1 to CH. 4 input range setting)
RWw2 (CH. 5 to CH. 8 input range setting)
RWw3 (Average processing specification)
RWw4 (CH. 1 average time, number of times setting)
RWw5 (CH. 2 average time, number of times setting)
RWw6 (CH. 3 average time, number of times setting)
RWw7 (CH. 4 average time, number of times setting)
RWw8 (CH. 5 average time, number of times setting)
RWw9 (CH. 6 average time, number of times setting)
RWwA (CH. 7 average time, number of times setting)
RWwB (CH. 8 average time, number of times setting)
Ver. 1 compatible For read
W000
W001
W002
W003
W004
W005
W006
W007
W008
W009
W00A
W00B
RWr0 (CH. 1 digital output value)
RWr1 (CH. 2 digital output value)
RWr2 (CH. 3 digital output value)
RWr3 (CH. 4 digital output value)
RWr4 (CH. 5 digital output value)
RWr5 (CH. 6 digital output value)
RWr6 (CH. 7 digital output value)
RWr7 (CH. 8 digital output value)
RWr8 (Error code)
RWr9 (Reserved)
RWrA (Reserved)
RWrB (Reserved)
Ver. 2 compatible For write
W1500
W1501
W1502
W1503
W1504
W1505
W1506
W1507
W1508
W1509
W150A
W150B
W150C
W150D
W150E
W150F
RWw0 (A/D conversion enable/ prohibit specification)
RWw1 (CH. 1 to CH. 4 input range setting)
RWw2 (CH. 5 to CH. 8 input range setting)
RWw3 (Average processing specification)
RWw4 (CH. 1 average time, number of times setting)
RWw5 (CH. 2 average time, number of times setting)
RWw6 (CH. 3 average time, number of times setting)
RWw7 (CH. 4 average time, number of times setting)
RWw8 (CH. 5 average time, number of times setting)
RWw9 (CH. 6 average time, number of times setting)
RWwA (CH. 7 average time, number of times setting)
RWwB (CH. 8 average time, number of times setting)
RWwC (Reserved)
RWwD (Reserved)
RWwE (Reserved)
RWwF (Reserved)
Ver. 2 compatible For read
W1000
W1001
W1002
W1003
W1004
W1005
W1006
W1007
W1008
W1009
W100A
W100B
W100C
W100D
W100E
W100F
RWr0 (CH. 1 digital output value)
RWr1 (CH. 2 digital output value)
RWr2 (CH. 3 digital output value)
RWr3 (CH. 4 digital output value)
RWr4 (CH. 5 digital output value)
RWr5 (CH. 6 digital output value)
RWr6 (CH. 7 digital output value)
RWr7 (CH. 8 digital output value)
RWr8 (Error code)
RWr9 (Reserved)
RWrA (Reserved)
RWrB (Reserved)
RWrC (Reserved)
RWrD (Reserved)
RWrE (Reserved)
RWrF (Reserved)

(3) Initial settings

Remote Device Station	Setting Item	Settings
AJ65VBTCU-68ADI	A/D conversion enable/prohibit specification (RWw0)	A/D conversion enable channel: Channel 1, 2
	CH. 1 to CH. 4 input range setting (RWw1)	Channel 1: 4 to 20mA Channel 2: User range setting
	Average processing specification (RWw3)	Channel 1: Sampling processing Channel 2: Average processing, number of times averaging
	CH. 2 average time, number of times setting (RWw5)	Number of average processing times of channel 2: 16 times
AJ65VBTCU-68ADVN	A/D conversion enable/prohibit specification (RWw0)	A/D conversion enable channel: Channel 1, 2
	CH. 1 to CH. 4 input range setting (RWw1)	Channel 1: 0 to 5V Channel 2: User range setting 1
	Average processing specification (RWw3)	Channel 1: Sampling processing Channel 2: Average processing, number of times averaging
	CH. 2 average time, number of times setting (RWw5)	Number of average processing times of channel 2: 16 times

POINT

When using the AJ65VBTCU-68ADVN as the ver. 2 remote device station in the normal mode, set the mode select switch to "3".

5.4.2 Setting of parameters and initialization procedure registration

The network parameters and automatic refresh parameters are set using GX Developer.
Use of the remote device station initialization procedure registration function makes initial setting easy.

(1) Parameter setting

(a) Network parameter setting

	1
Start I/O No.	0000
Operational setting	Operational settings
Type	Master station
Master station data link type	PLC parameter auto start
Mode	Remote net(Additional mode)
All connect count	2
Remote input(RX)	
Remote output(RY)	
Remote register(RWr)	
Remote register(RWw)	
Ver.2 Remote input(RX)	
Ver.2 Remote output(RY)	
Ver.2 Remote register(RWr)	
Ver.2 Remote register(RWw)	
Special relay(SB)	
Special register(SW)	
Retry count	3
Automatic reconnection station count	1
Stand by master station No.	
PLC down select	Stop
Scan mode setting	Asynchronous
Delay infomation setting	0
Station information setting	Station information
Remote device station initial setting	Initial settings
Interrupt setting	Interrupt settings

Station No.	Station type	Expanded cyclic setting	Exclusive station count	Remote station points	Reserve/invalid station select	Intelligent buffer select(word) Send	Receive	Automatic
1/ 1	Ver.1Remote device station	single	Exclusive station 3	96 points	No setting			
2/ 4	Ver.2Remote device station	quadruple	Exclusive station 1	64 points	No setting			

(b) Automatic refresh parameter setting

	1
Start I/O No.	0000
Operational setting	Operational settings
Type	Master station
Master station data link type	PLC parameter auto start
Mode	Remote net(Additional mode)
All connect count	2
Remote input(RX)	X1000
Remote output(RY)	Y1000
Remote register(RWr)	W0
Remote register(RWw)	W100
Ver.2 Remote input(RX)	X1500
Ver.2 Remote output(RY)	Y1500
Ver.2 Remote register(RWr)	W1000
Ver.2 Remote register(RWw)	W1500
Special relay(SB)	SB0
Special register(SW)	SW0
Retry count	3
Automatic reconnection station count	1
Stand by master station No.	
PLC down select	Stop
Scan mode setting	Asynchronous
Delay infomation setting	0
Station information setting	Station information
Remote device station initial setting	Initial settings
Interrupt setting	Interrupt settings

(2) Initial setting by remote device station initialization procedure registration function

(a) Setting of target station numbers

Set the station numbers to which initial setting will be made.

Set the target station numbers to "1" and "4".

	Target station No.	No. of registered procedures			Target station No.	No. of registered procedures	
1	1	0	Regist procedure	9			Regist procedure
2	4	0	Regist procedure	10			Regist procedure
3			Regist procedure	11			Regist procedure

(b) Selection of procedure registration (part 1)

Make setting for the AJ65VBTCU-68ADI.

Click Procedure registration of target station number "1".

(c) Setting of procedure registration (part 1)

Set the conditions and execution for the AJ65VBTCU-68ADI.

When the initial data processing request flag (RX18) turns ON and Remote device station initialization procedure registration (SB0D) is set, the following data are registered to the AJ65VBTCU-68ADI.

Procedure Execution Condition in AJ65VBTCU-68ADI	Execution Data
Initial data processing request flag (RX18) turns ON	A/D conversion enable/prohibit specification: Channel 1, 2: Enable (RWw0 :0003H)
	CH.1 to CH.4 input range setting : channel 1: 4 to 20mA : channel 2: user range setting (RWw1: 20H)
	Average processing specification : channel 1: sampling processing : Channel 2: Average processing, number of times averaging (RWw3: 200H)
	CH. 2 average time, number of times setting: Channel 2: 16 times (RWw5: 10H)
	Initial data processing completion flag (RY18) is turned ON.
	Initial data processing request flag (RY19) is turned ON.
Initial data processing request flag (RX18) turns OFF	Initial data processing completion flag (RY18) is turned OFF.
Initial data setting completion flag (RX19) turns ON	Initial data setting request flag (RY19) is turned OFF.

(d) Setting result (part 1)

The following indicates the setting result of the AJ65VBTCU-68ADI.

Remote device station initial setting: Procedure registration module 1: Target station 1

Input format: HEX.

Execute Flag	Operational condition	Executional condition: Condition Device	Device Number	Execute Condition	Details of execution: Write Device	Device Number	Write Data
Execute	Set new	RX	18	ON	RWw	00	0003
Execute	Same as prev.set	RX	18	ON	RWw	01	0020
Execute	Same as prev.set	RX	18	ON	RWw	03	0200
Execute	Same as prev.set	RX	18	ON	RWw	05	0010
Execute	Same as prev.set	RX	18	ON	RY	18	ON
Execute	Same as prev.set	RX	18	ON	RY	19	ON
Execute	Set new	RX	18	OFF	RY	18	OFF
Execute	Set new	RX	19	ON	RY	19	OFF

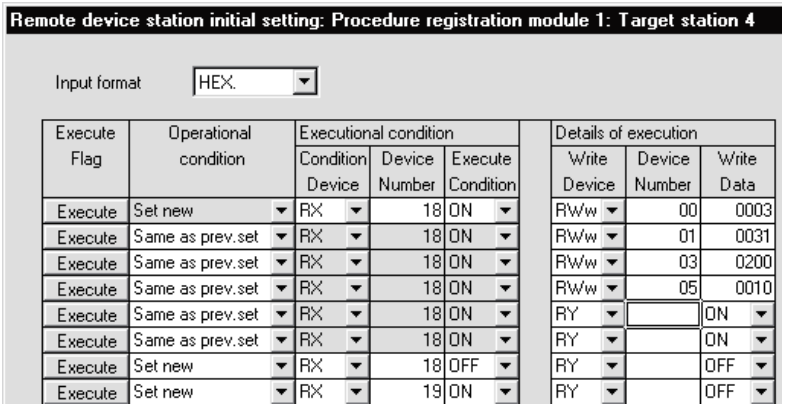
(e) Selection of procedure registration (part 2)
Make setting for the AJ65VBTCU-68ADVN.
Click Procedure registration of target station number "4".

(f) Setting of procedure registration (part 2)
Set the conditions and execution for the AJ65VBTCU-68ADVN.

When the initial data processing request flag (RX18) turns ON and Remote device station initialization procedure registration (SB0D) is set, the following data are registered to the AJ65VBTCU-68ADVN.

Procedure Execution Condition in AJ65VBTCU-68ADVN	Execution Data
Initial data processing request flag (RX18) turns ON	A/D conversion enable/prohibit specification: Channel 1, 2: Enable (RWw0 :0003H)
	CH. 1 to CH. 4 input range setting : Channel 1: 0 to 5V : Channel 2: User range setting 1 (RWw1: 31H)
	Average processing specification : Channel 1: Sampling processing : Channel 2: Average processing, number of times averaging (RWw3: 200H)
	CH. 2 average time, number of times setting: Channel 2: 16 times (RWw5: 10H)
	Initial data processing completion flag (RY18) is turned ON.
	Initial data setting request flag (RY19) is turned ON.
Initial data processing request flag (RX18) turns OFF	Initial data processing completion flag (RY18) is turned OFF.
Initial data setting completion flag (RX19) turns ON	Initial data setting request flag (RY19) is turned OFF.

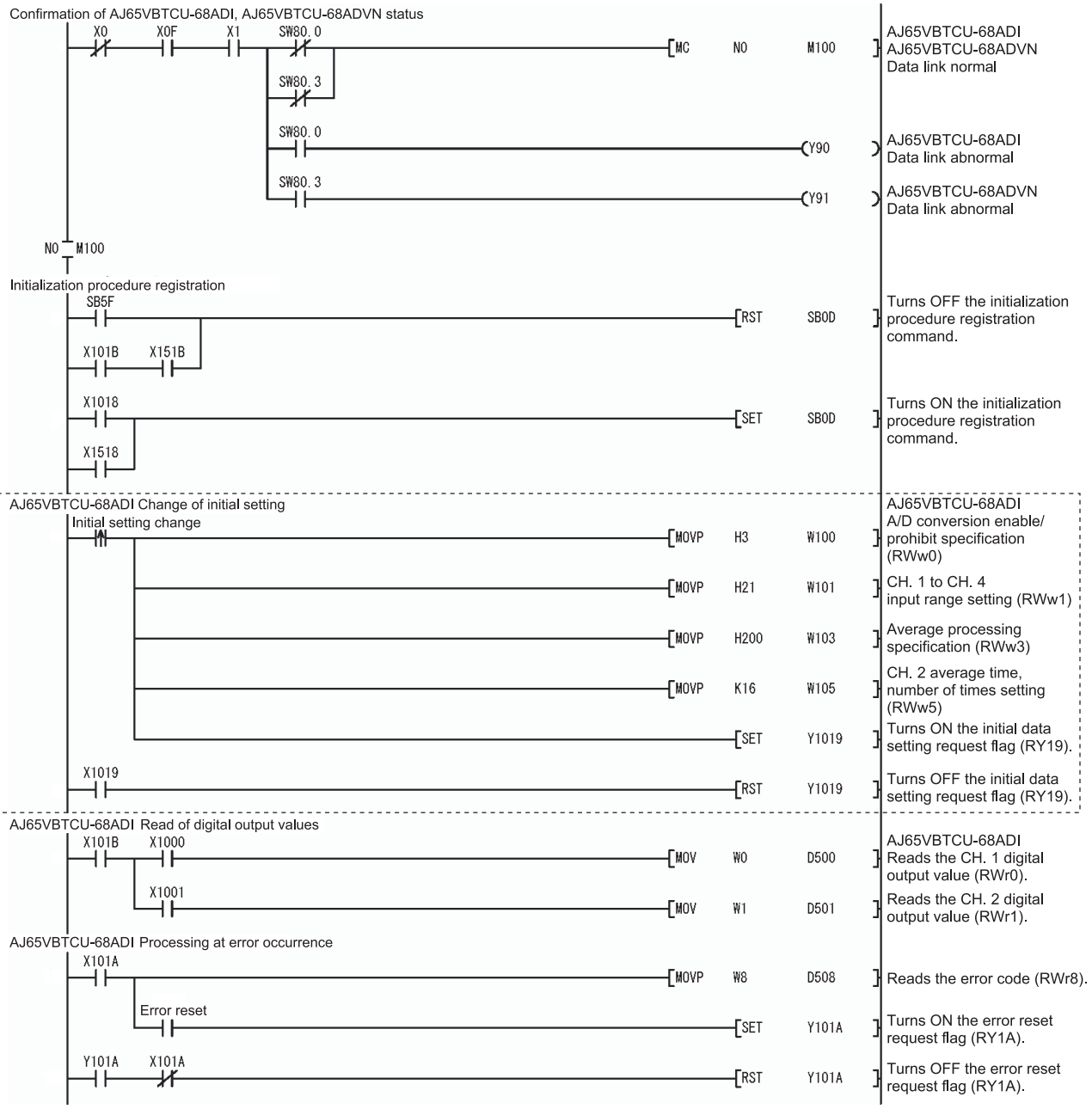
(g) Setting result (part 2)
The following indicates the setting result of the AJ65VBTCU-68ADVN.


Remote device station initial setting: Procedure registration module 1: Target station 4
Input format
HEX.
Execute Flag
Operational condition
Executional condition
Condition Device
Device Number
Execute Condition
Details of execution
Write Device
Device Number
Write Data
Execute Set new RX 18 ON RWw 00 0003
Execute Same as prev.set RX 18 ON RWw 01 0031
Execute Same as prev.set RX 18 ON RWw 03 0200
Execute Same as prev.set RX 18 ON RWw 05 0010
Execute Same as prev.set RX 18 ON RY ON
Execute Same as prev.set RX 18 ON RY ON
Execute Set new RX 18 OFF RY OFF
Execute Set new RX 19 ON RY OFF

POINT

For the case where the remote device station initialization procedure registration function is not used but a sequence program is used to make setting, refer to the user's manual of the used master module.

5.4.3 Program example



* The program part enclosed by the dotted line is required only when the initial setting is changed.

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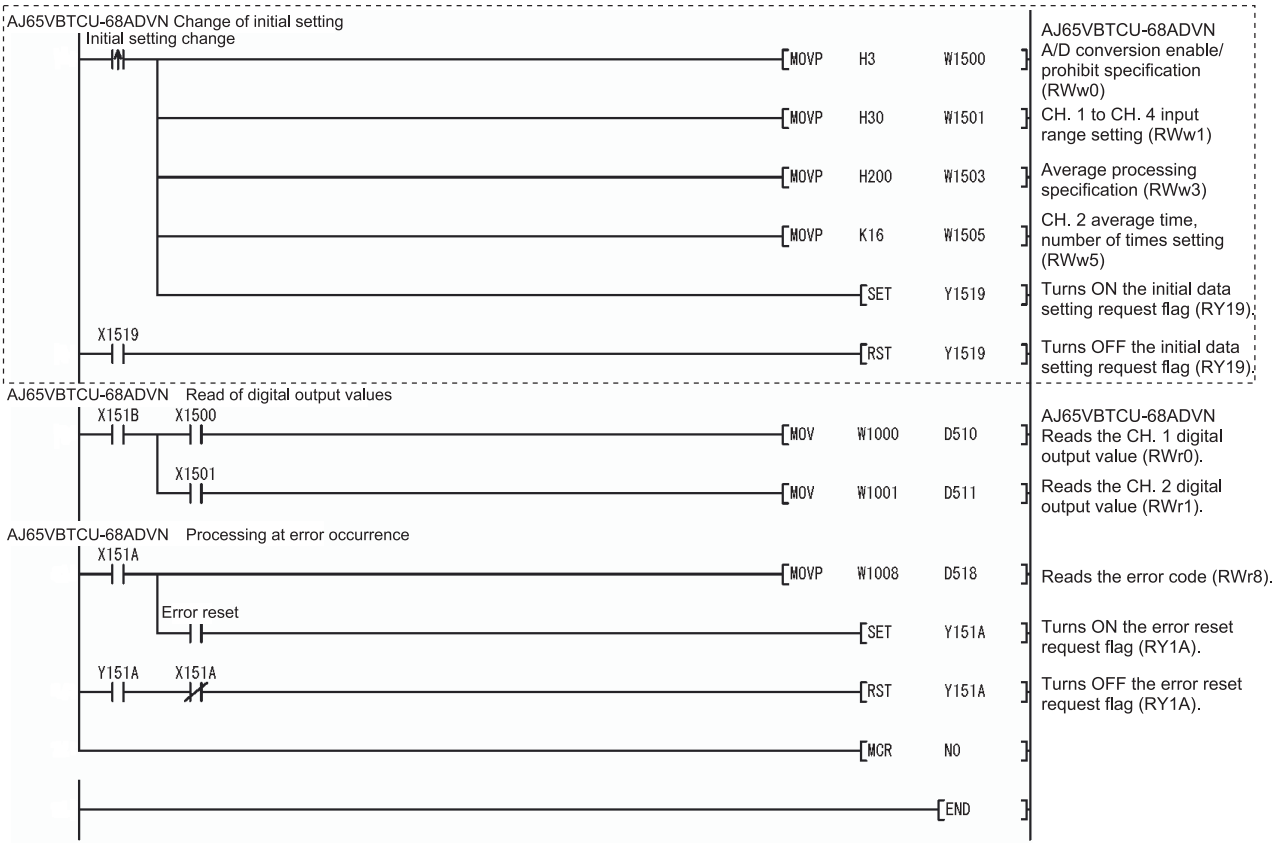
AJ65VBTCU-68ADVN Change of initial setting
Initial setting change
MOVP H3 W1500
AJ65VBTCU-68ADVN A/D conversion enable/ prohibit specification (RWw0)
MOVP H30 W1501
CH. 1 to CH. 4 input range setting (RWw1)
MOVP H200 W1503
Average processing specification (RWw3)
MOVP K16 W1505
CH. 2 average time, number of times setting (RWw5)
SET Y1519
Turns ON the initial data setting request flag (RY19).
X1519
RST Y1519
Turns OFF the initial data setting request flag (RY19).
AJ65VBTCU-68ADVN Read of digital output values
X151B X1500
MOV W1000 D510
AJ65VBTCU-68ADVN Reads the CH. 1 digital output value (RWr0).
X1501
MOV W1001 D511
Reads the CH. 2 digital output value (RWr1).
AJ65VBTCU-68ADVN Processing at error occurrence
X151A
MOVP W1008 D518
Reads the error code (RWr8).
Error reset
SET Y151A
Turns ON the error reset request flag (RY1A).
Y151A X151A
RST Y151A
Turns OFF the error reset request flag (RY1A).
MCR N0
END

* The program part enclosed by the dotted line is required only when the initial setting is changed.

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MEMO

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6 TROUBLESHOOTING

The details of the errors which may occur when using the AJ65VBTCU-68ADVN/ADIN and troubleshooting are described.

6.1 Error Code List

If an error occurs (the "RUN" LED of the AJ65VBTCU-68ADVN/ADIN flickers) during write of data from the programmable controller CPU to the master module, the corresponding error code is stored into the remote register RWrn+8 of the AJ65VBTCU-68ADVN/ADIN.

Table 6.1 Error Code List (Errors detected by AJ65VBTCU-68ADVN/ADIN)

Error Code (Decimal)	Cause	Action
10□	The average number of times setting is outside the range.	Correct the average number of times setting to within 1 to 10000.
11□	The average time setting is outside the range.	Correct the average time setting to within 4 to 10000.
20□	The input range setting is outside the setting range.	Correct the input range setting to within the setting range.

□ indicates the channel No. where the error occurred.

(1) If the average time/number of times setting error occurs, the "RUN" LED flickers at intervals of 0.5s and A/D conversion processing is performed with the average time or number of times used prior to error occurrence.
If the input range setting error occurs, the "RUN" LED flickers at intervals of 0.1s and A/D conversion processing is not performed on all channels.

(2) If two or more errors occurred, the error code of the first error is stored and the other errors are not stored.

(3) To reset the error code, turn on the error reset request flag RY(n+1)A.

6 - 1

6.2 Using the LED Indications to Check Errors

This section explains how to check errors using the LED indications of the AJ65VBTCU-68ADVN/ADIN.
Refer to the programmable controller CPU and master module user's manual for issues regarding the programmable controller CPU and master module.

(1) When the AJ65VBTCU-68ADVN/ADIN "POWER" LED is off

Check item	Corrective action
Is 24VDC power on?	Check the external power supply.
Is the voltage of the 24VDC power supply within the specified value?	Set the voltage value to within the range 20.4 to 26.4V.

(2) When the AJ65VBTCU-68ADVN/ADIN "RUN" LED is flashing

Check item		Corrective action
Is the LED flickering at 0.1s intervals in the normal mode?	When used as the ver. 1 remote device station (ver. 1 compatible slave station)	1. Check that the mode select switch is not set to other than 0. (When the module is used as the ver. 1 remote device station, set the mode select switch to "0".) 2. Check the error code (RWrn+8) to confirm the channel where the input range setting error occurred. 3. Correct the sequence program or GX Developer setting.
	When used as the ver. 2 remote device station (ver. 2 compatible slave station)	1. Check that the mode select switch is not set to other than 3. (When the module is used as the ver. 2 remote device station, set the mode select switch to "3".) 2. Check the error code (RWrn+8) to confirm the channel where the input range setting error occurred. 3. Correct the sequence program or GX Developer setting.
Is the LED flickering at 0.5s intervals in the normal mode?		1. Check that the mode select switch has not been moved from the position at power-on. (When the switch is returned to the original setting, the flickering LED is lit.) 2. Check the error code (RWrn+8) to confirm the channel where the average number of times setting or average time setting error occurred. 3. Correct the sequence program or GX Developer setting.
Is the LED flickering at 0.1s intervals in the test mode?		Check that the mode select switch is not outside the setting range.
Is the LED flickering at 0.5s intervals in the test mode?		Change the offset/gain adjustment to within the available setting range.

(3) When the AJ65VBTCU-68ADVN/ADIN "RUN" LED is off

Check item	Corrective action
Is an attempt made to perform operation in the normal mode with the mode select switch set in the test mode?	Switch power on again after setting the mode select switch to the normal mode.
Has the watchdog timer error occurred?	Using the link special registers (SW0084 to SW0087) of the master module, check the watchdog timer error and power on the AJ65VBTCU-68ADVN/ADIN again. If the "RUN" LED is not lit after power is switched on again, the possible cause is a hardware fault. Contact your nearest Mitsubishi representative.

(4) When the AJ65VBTCU-68ADVN/ADIN "L RUN" LED is off

Communications are broken.

For details, refer to troubleshooting in the user's manual of the master module used.

(5) When the AJ65VBTCU-68ADVN/ADIN "L ERR." LED flickers at fixed intervals

Check item	Corrective action
Has the station number or transmission speed setting switch position been changed during normal operation?	After correcting the setting switch setting, switch power on again.
Is the station number or transmission speed setting switch faulty?	If the "L ERR." LED has begun flickering though switch setting change was not made during operation, the possible cause is a hardware fault. Contact your nearest Mitsubishi representative.

(6) When the AJ65VBTCU-68ADVN/ADIN "L ERR." LED flickers at unfixed intervals

Check item	Corrective action
Have you forgotten fitting the terminating resistor?	Check whether the terminating resistor is fitted. If it is not connected, connect it and switch power on again.
Is the module or CC-Link dedicated cable affected by noise?	Earth both ends of the shield wire of the CC-Link dedicated cable to the protective earth conductor via SLD and FG of the corresponding module. Earth the FG terminal of the module without fail. When carrying out wiring in piping, earth the pipe without fail.

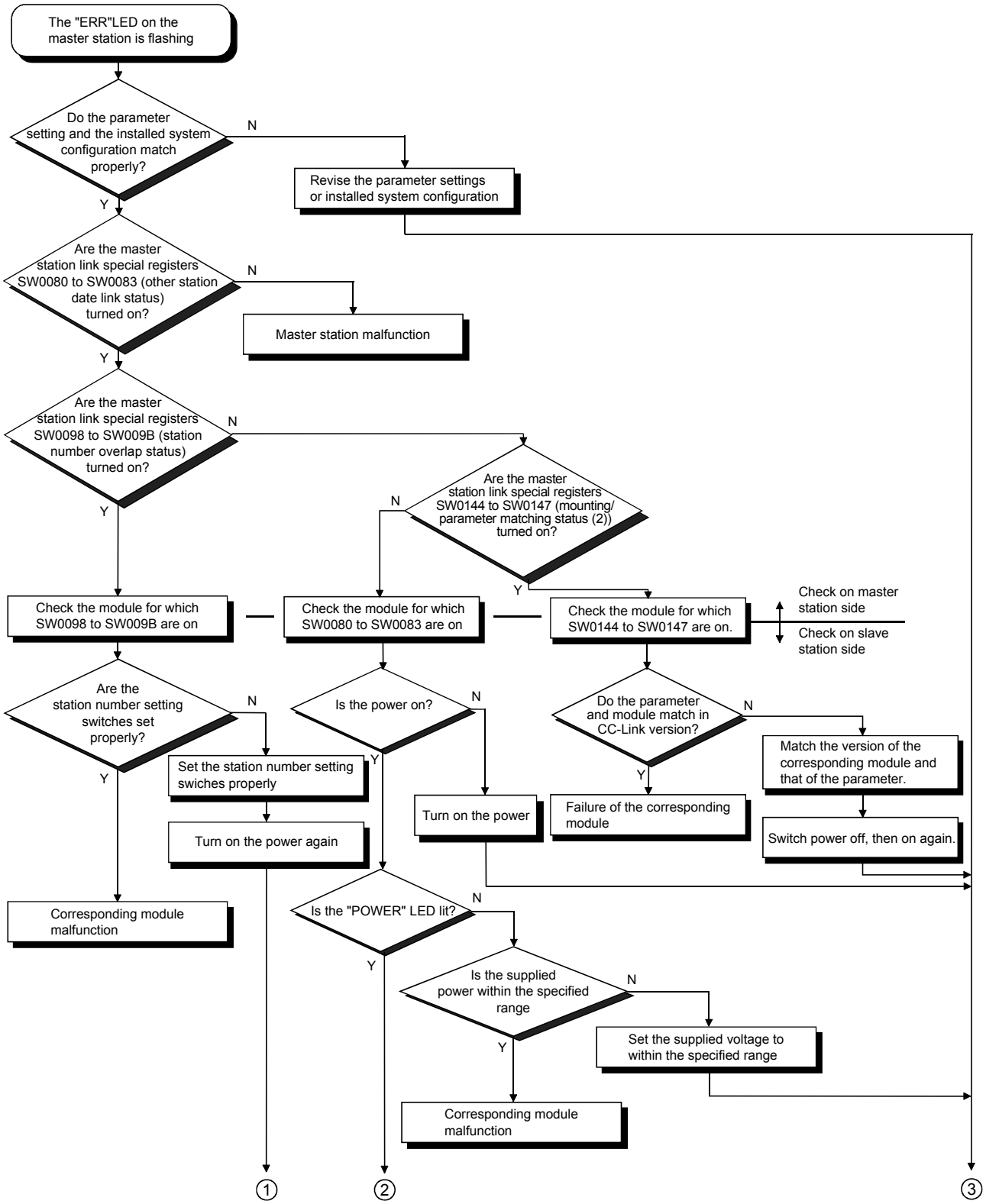
(7) When the AJ65VBTCU-68ADVN/ADIN "L ERR." LED is on

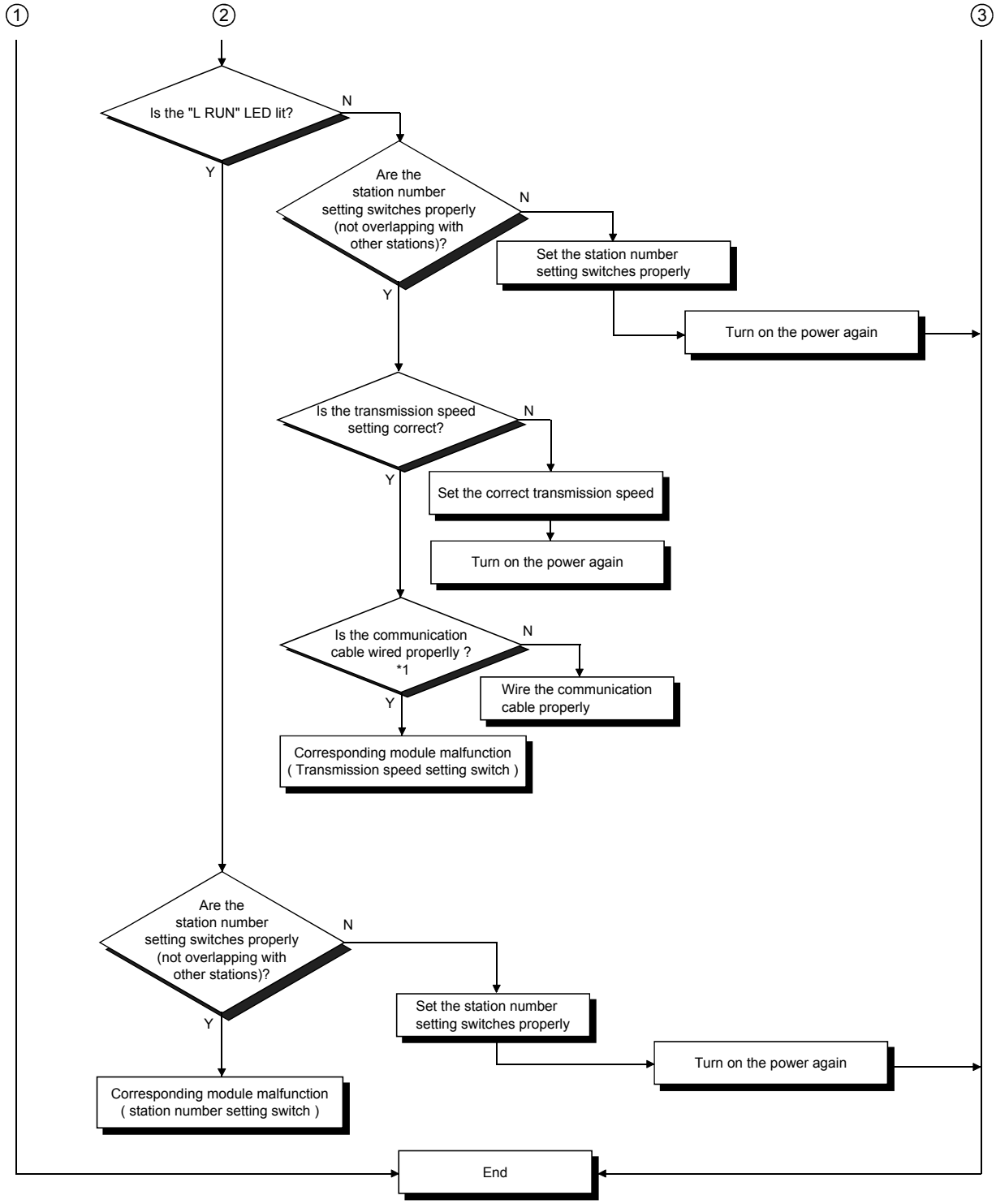
Check item	Corrective action
Are the station number and transmission speed correct?	Set the correct station number and transmission speed.

6.3 When the digital output value cannot be read

Check item	Corrective action
Is the "POWER" LED off?	Take action as described in Section 6.2 (1).
Is the "RUN" LED flashing or off?	Take action as described in Section 6.2 (2), (3).
Is the "L RUN" LED off?	Take action as described in Section 6.2 (4).
Is the "L ERR." LED on?	Take action as described in Section 6.2 (7). Check the error details according to the master module user's manual.
Is the programmable controller CPU "RUN" LED flashing or off?	Check the error details according to the programmable controller CPU user's manual.
Is the master module "RUN" LED off?	Check the error details according to the master module user's manual.
Is the master module [RD] [SD] LED on?	Check the error details according to the master module user's manual.
Is the analog input signal line disconnected, cut off, or any errors?	Check the error area by checking the signal line visually or by conductive check.
Remove the AJ65VBTCU-68ADVN/ADIN analog input cable. Apply the test voltage (stable power supply or battery) to this module's terminal, and measure the digital output value.	If he AJ65VBTCU-68ADVN/ADIN module digital output value is normal, the effects are being received by noise from an external wiring. So check the wiring and grounding method. Lift the AJ65VBTCU-68ADVN/ADIN from the system, and remove the grounding circuit. (install to the DIN rail.)

6.4 Troubleshooting for the Case where the "ERR." LED of the Master Station Flickers


The "ERR"LED on the master station is flashing
Do the parameter setting and the installed system configuration match properly?
N
Revise the parameter settings or installed system configuration
Y
Are the master station link special registers SW0080 to SW0083 (other station date link status) turned on?
N
Master station malfunction
Y
Are the master station link special registers SW0098 to SW009B (station number overlap status) turned on?
N
Y
Are the master station link special registers SW0144 to SW0147 (mounting/ parameter matching status (2)) turned on?
N
Y
Check the module for which SW0098 to SW009B are on
Check the module for which SW0080 to SW0083 are on
Check the module for which SW0144 to SW0147 are on.
Check on master station side
Check on slave station side
Are the station number setting switches set properly?
N
Y
Set the station number setting swiches properly
Turn on the power again
Is the power on?
N
Y
Turn on the power
Do the parameter and module match in CC-Link version?
N
Y
Failure of the corresponding module
Match the version of the corresponding module and that of the parameter.
Switch power off, then on again.
Corresponding module malfunction
Is the "POWER" LED lit?
N
Y
Is the supplied power within the specified range
N
Y
Set the supplied voltage to within the specified range
Corresponding module malfunction
①
②
③


①
②
③
Is the "L RUN" LED lit?
N
Y
Are the station number setting switches properly (not overlapping with other stations)?
N
Y
Set the station number setting switches properly
Turn on the power again
Is the transmission speed setting correct?
N
Y
Set the correct transmission speed
Turn on the power again
Is the communication cable wired properlly ? *1
N
Y
Wire the communication cable properly
Corresponding module malfunction (Transmission speed setting switch)
Are the station number setting switches properly (not overlapping with other stations)?
N
Y
Set the station number setting switches properly
Turn on the power again
Corresponding module malfunction (station number setting switch)
End

*1 Check for a short, reversed connection, wire breakage, terminal resistor, FG connection, overall distance and station-to-station distance.

APPENDICES

Appendix 1 Comparison, Differences and Compatibility between New and Conventional Models

(1) Comparison between AJ65VBTCU-68ADV/ADI and AJ65VBTCU-68ADVN/ADIN

The following table indicates the comparison between the AJ65VBTCU-68ADV/ADI and AJ65VBTCU-68ADVN/ADIN.

Comparison between AJ65VBTCU-68ADV/ADI and AJ65VBTCU-68ADVN/ADIN

<table>
<tr><th>Item</th><th colspan="2">AJ65VBTCU-68ADV/ADI</th><th colspan="3">AJ65VBTCU-68ADVN/ADIN</th></tr>
<tr><td rowspan="2">System compatibility (Station type, mode)</td><td colspan="2">Ver. 1 remote device station (ver. 1 compatible slave station) or remote device station</td><td colspan="3">• Ver. 1 remote device station (ver. 1 compatible slave station) or remote device station
• Ver. 2 remote device station (ver. 2 compatible slave station)</td></tr>
<tr><td colspan="2">Remote net ver. 1 mode or remote net mode</td><td colspan="3">• Remote net ver. 1 mode or remote net mode
• Remote net ver. 2 mode
• Remote net additional mode</td></tr>
<tr><td>Number of occupied stations</td><td colspan="2">3 stations (RX/RY 32 points each, RWr/RWw 12 points each)</td><td colspan="3">Ver. 1 remote device station (ver. 1 compatible slave station) setting: 3 stations (RX/RY 32 points each, RWr/RWw 12 points each)
Ver. 2 remote device station (ver. 2 compatible slave station) setting: 1 station (RX/RY 32 points each, RWr/RWw 16 points each)</td></tr>
<tr><td>Operation status indicator LED/RUN LED</td><td>Normal mode</td><td>On : During normal operation
Flicker : 0.1s intervals Input range setting error, mode select switch setting error
0.5s intervals Average value setting (number of times, time) error
Off : 24VDC power off or watchdog timer error</td><td>Normal mode</td><td colspan="2">On : During normal operation
Flicker : 0.1s intervals Input range setting error, mode select switch setting error, or when this module is set as the ver. 2 remote device station (ver. 2 compatible slave station) and used with the remote net ver. 1 mode selected in the mode setting of the network parameter.
0.5s intervals Average value setting (number of times, time) error, or when the mode select switch setting is changed after power-on.
Off : 24VDC power off or watchdog timer error</td></tr>
<tr><td rowspan="6">Mode select switch (factory setting "0")</td><td colspan="2">AJ65VBTCU-68ADV</td><td colspan="3">AJ65VBTCU-68ADVN</td></tr>
<tr><td colspan="2" rowspan="3">0: Normal mode
1: Test mode (user range setting 1)
2: Test mode (user range setting 2)
3 to 7: Reserved</td><td>Ver. 1 remote device station (Ver. 1 compatible slave station)</td><td colspan="2">0: Normal mode
1: Test mode (user range setting 1)
2: Test mode (user range setting 2)</td></tr>
<tr><td>Ver. 2 remote device station (Ver. 2 compatible slave station)</td><td colspan="2">3: Normal mode
4: Test mode (user range setting 1)
5: Test mode (user range setting 2)</td></tr>
<tr><td>–</td><td colspan="2">6 to 7: Reserved</td></tr>
<tr><td colspan="2">AJ65VBTCU-68ADI</td><td colspan="3">AJ65VBTCU-68ADIN</td></tr>
<tr><td colspan="2" rowspan="3">0: Normal mode
1: Test mode (user range setting)
2 to 7: Reserved</td><td>Ver. 1 remote device station (Ver. 1 compatible slave station)</td><td colspan="2">0: Normal mode
1: Test mode (user range setting)</td></tr>
<tr><td>Ver. 2 remote device station (Ver. 2 compatible slave station)</td><td colspan="2">3: Normal mode
4: Test mode (user range setting)</td></tr>
<tr><td>–</td><td colspan="2">2, 5 to 7: Reserved</td></tr>
</table>

A

(2) Differences between AJ65VBTCU-68ADV/ADI and AJ65VBTCU-68ADVN/ADIN

The AJ65VBTCU-68ADVN/ADIN can be handled according to the system. (Refer to Section 4.4 for details.)

For the AJ65VBTCU-68ADV/ADI, the number of stations occupied by the module was 3 stations.
For the AJ65VBTCU-68ADVN/ADIN, the number of stations occupied by the module can be handled as 1 station by setting the mode select switch of the module to the ver. 2 remote device station.

Further, for the AJ65VBTCU-68ADVN/ADIN, the number of stations occupied by the module can also be handled as 3 stations, like the AJ65VBTCU-68ADV/ADI, by setting the mode select switch of the module to the ver. 1 remote device station.

In the system where the maximum number of connected stations of the master station exceeds 64 stations when the number of stations occupied by the AJ65VBTCU-68ADVN/ADIN is handled as 3 stations, use of the AJ65VBTCU-68ADVN/ADIN in the above setting can increase the number of connected remote device stations.

(3) Compatibility between AJ65VBTCU-68ADV/ADI and AJ65VBTCU-68ADVN/ADIN

There is compatibility when the AJ65VBTCU-68ADVN/ADIN is used as the ver. 1 remote device station in the existing system. (Refer to Section 4.4 for details.)

When the AJ65VBTCU-68ADV is replaced by the AJ65VBTCU-68ADVN or the AJ65VBTCU-68ADI is replaced by the AJ65VBTCU-68ADIN in the existing system, the replacement can be made without the programs being modified since the remote I/O signals, remote registers, etc. are the same.

Set the mode select switch of the module to the ver. 1 remote device station and use the same station number.

POINT

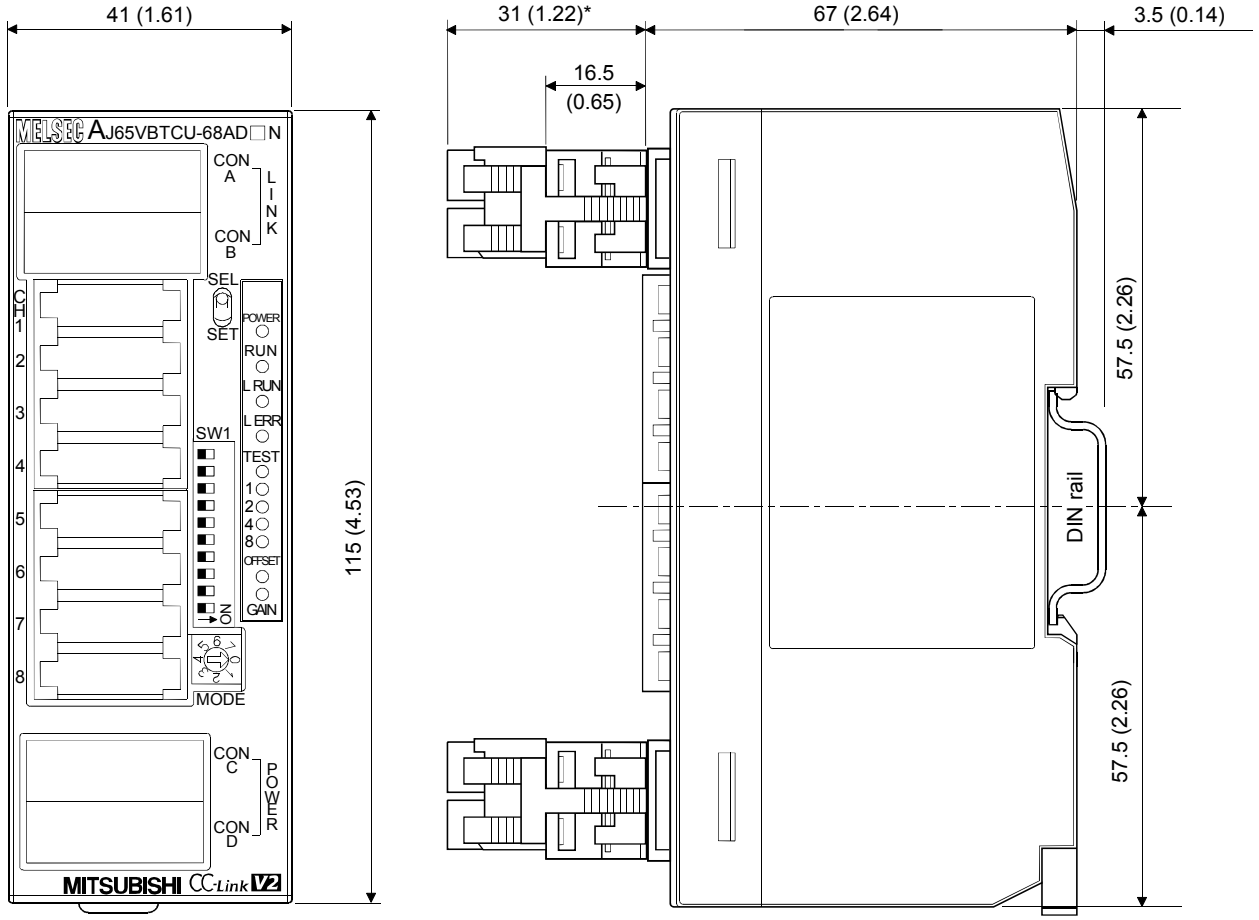
To handle the AJ65VBTCU-68ADVN/ADIN according to the system, the mode select switch of the module must be set, and at the same time, "mode setting" and "station information (station type)" in the network parameters of GX Developer must also be set.
Set the network parameters of GX Developer according to the system.

APPX - 2

Appendix 2 External dimension diagram

The outline dimension drawing of the AJ65VBTCU-68ADVN/ADIN is shown below.

[AJ65VBTCU-68ADVN/ADIN]



* :This section should be 14.5mm (0.57inch) when an online connector is not installed.

Unit : mm (inch)

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WARRANTY

Please confirm the following product warranty details before using this product.

1. Gratis Warranty Term and Gratis Warranty Range

If any faults or defects (hereinafter "Failure") found to be the responsibility of Mitsubishi occurs during use of the product within the gratis warranty term, the product shall be repaired at no cost via the sales representative or Mitsubishi Service Company.

However, if repairs are required onsite at domestic or overseas location, expenses to send an engineer will be solely at the customer's discretion. Mitsubishi shall not be held responsible for any re-commissioning, maintenance, or testing on-site that involves replacement of the failed module.

[Gratis Warranty Term]

The gratis warranty term of the product shall be for one year after the date of purchase or delivery to a designated place. Note that after manufacture and shipment from Mitsubishi, the maximum distribution period shall be six (6) months, and the longest gratis warranty term after manufacturing shall be eighteen (18) months. The gratis warranty term of repair parts shall not exceed the gratis warranty term before repairs.

[Gratis Warranty Range]

(1) The range shall be limited to normal use within the usage state, usage methods and usage environment, etc., which follow the conditions and precautions, etc., given in the instruction manual, user's manual and caution labels on the product.

(2) Even within the gratis warranty term, repairs shall be charged for in the following cases.

1. Failure occurring from inappropriate storage or handling, carelessness or negligence by the user. Failure caused by the user's hardware or software design.
2. Failure caused by unapproved modifications, etc., to the product by the user.
3. When the Mitsubishi product is assembled into a user's device, Failure that could have been avoided if functions or structures, judged as necessary in the legal safety measures the user's device is subject to or as necessary by industry standards, had been provided.
4. Failure that could have been avoided if consumable parts (battery, backlight, fuse, etc.) designated in the instruction manual had been correctly serviced or replaced.
5. Failure caused by external irresistible forces such as fires or abnormal voltages, and Failure caused by force majeure such as earthquakes, lightning, wind and water damage.
6. Failure caused by reasons unpredictable by scientific technology standards at time of shipment from Mitsubishi.
7. Any other failure found not to be the responsibility of Mitsubishi or that admitted not to be so by the user.

2. Onerous repair term after discontinuation of production

(1) Mitsubishi shall accept onerous product repairs for seven (7) years after production of the product is discontinued. Discontinuation of production shall be notified with Mitsubishi Technical Bulletins, etc.

(2) Product supply (including repair parts) is not available after production is discontinued.

3. Overseas service

Overseas, repairs shall be accepted by Mitsubishi's local overseas FA Center. Note that the repair conditions at each FA Center may differ.

4. Exclusion of loss in opportunity and secondary loss from warranty liability

Regardless of the gratis warranty term, Mitsubishi shall not be liable for compensation of damages caused by any cause found not to be the responsibility of Mitsubishi, loss in opportunity, lost profits incurred to the user by Failures of Mitsubishi products, special damages and secondary damages whether foreseeable or not, compensation for accidents, and compensation for damages to products other than Mitsubishi products, replacement by the user, maintenance of on-site equipment, start-up test run and other tasks.

5. Changes in product specifications

The specifications given in the catalogs, manuals or technical documents are subject to change without prior notice.

SH(NA)-080401E-F(1206)MEE
MODEL: AJ65V-68ADN-U-SY-E
MODEL CODE: 13JR65

MITSUBISHI ELECTRIC CORPORATION

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NAGOYA WORKS : 1-14 , YADA-MINAMI 5-CHOME , HIGASHI-KU, NAGOYA , JAPAN

When exported from Japan, this manual does not require application to the Ministry of Economy, Trade and Industry for service transaction permission.

Specifications subject to change without notice.